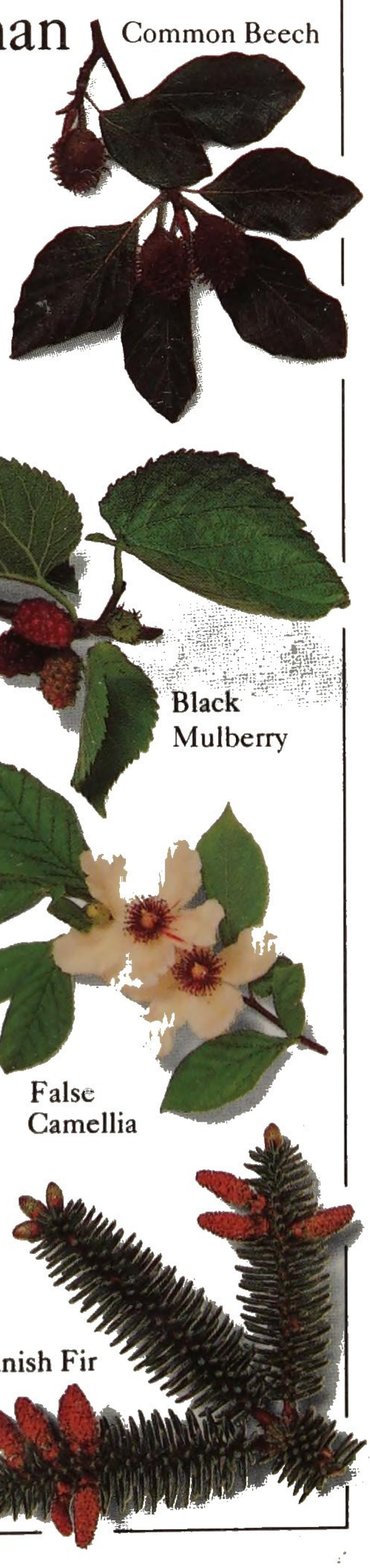
EYEWITNESS HANDBOOKS

TREES

The visual guide to more than 500 species of trees from around the world

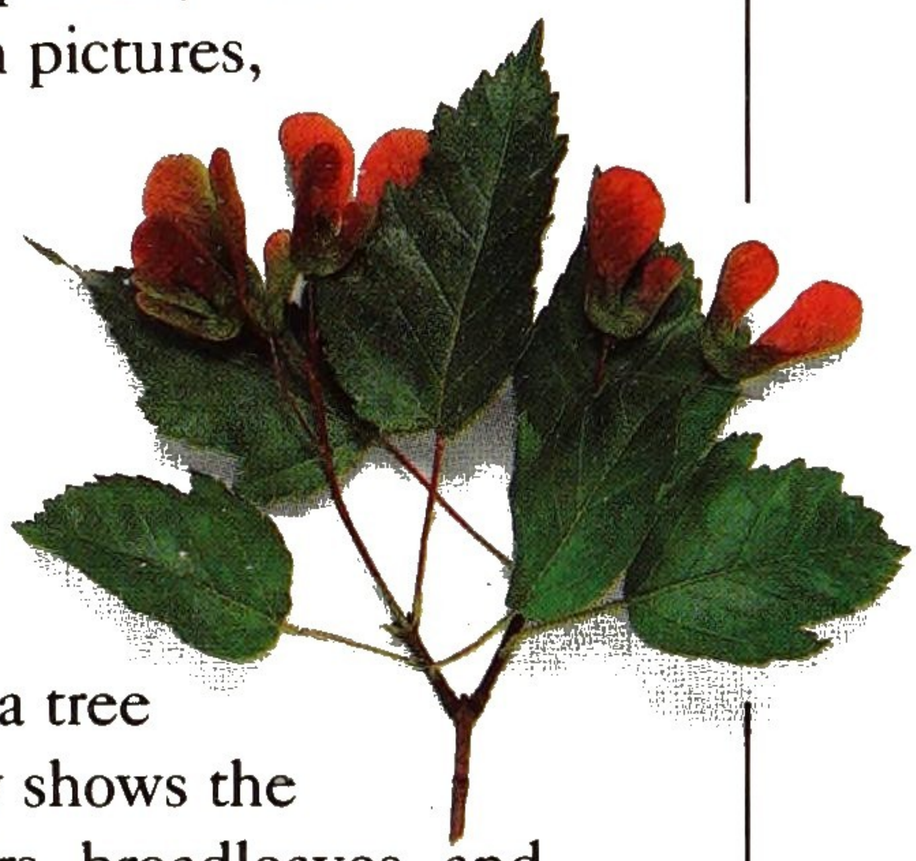


Allen J. Coombes

EYEWITNESS HANDBOOKS

TREES

The *Eyewitness Handbook of Trees* is packed with 600 vivid full-color photos of more than 500 species of trees. The authoritative and systematic photographic approach, with words never separated from pictures, marks a new generation of identification guides.



Identification made easy

This book is designed for beginners and experienced enthusiasts alike. The introduction explains what a tree is, and a visual identity key shows the differences between conifers, broadleaves, and palms. The key identifies each genus by leaf type, instantly guiding the reader to the correct entry.

Photo-encyclopedic approach

Each species entry offers both scientific and common names, and combines precise description with annotated photographs to highlight the tree's characteristics and distinguishing features. In addition, each entry features an illustration showing the spread and leaves of the tree, as well as color-coded bands that provide at-a-glance facts for quick reference. Finally, a concise glossary provides instant understanding of botanical terms.

$29.95

EYEWITNESS HANDBOOKS

TREES

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TREES

ALLEN J. COOMBES

Photography by
MATTHEW WARD

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LOOKING AT TREES

Whether standing in isolation on a windy hillside, crowded together in dense forest, or lining a city street, trees form an important element of nearly every landscape. The almost infinite variation of trees through the seasons – not only in shape, size, color, and texture, but also in the finer details of leaves, flowers, fruit, and bark – makes the study of these familiar plants an ever-changing, yet enduring, source of delight.

THE FACT THAT trees survive almost everywhere means that you can appreciate and study them wherever you happen to be. In the countryside, they grow, it is hoped but not always, as nature intends; in urban environments, planted along streets, and in parks and public gardens, they give solace among man-made structures. Of course, while there is nothing to compare with seeing trees growing wild in their natural habitat, towns and cities are still excellent places for observing and learning more about them.

THE TREE SELECTION

This book includes only those species of tree that grow wild in the temperate regions of the world. In the northern hemisphere, this covers most of Asia, North America, Europe south to the Mediterranean, the Himalayas, and most of China; in the southern hemisphere, it includes South America, the cooler regions of Australia, and New Zealand. From within this extensive area, I have made a selection of plants that illustrates the amazing diversity of trees that can be found throughout the world. At the same time, I have tried to include most of the species that you are likely to find planted in gardens and along streets, as well as a few that are unusual or more rare.

BEECH WOOD IN AUTUMN
An English beech wood is one of the glories of autumn. Its densely leafy canopy allows little light to penetrate, with the result that little else can grow beneath it.

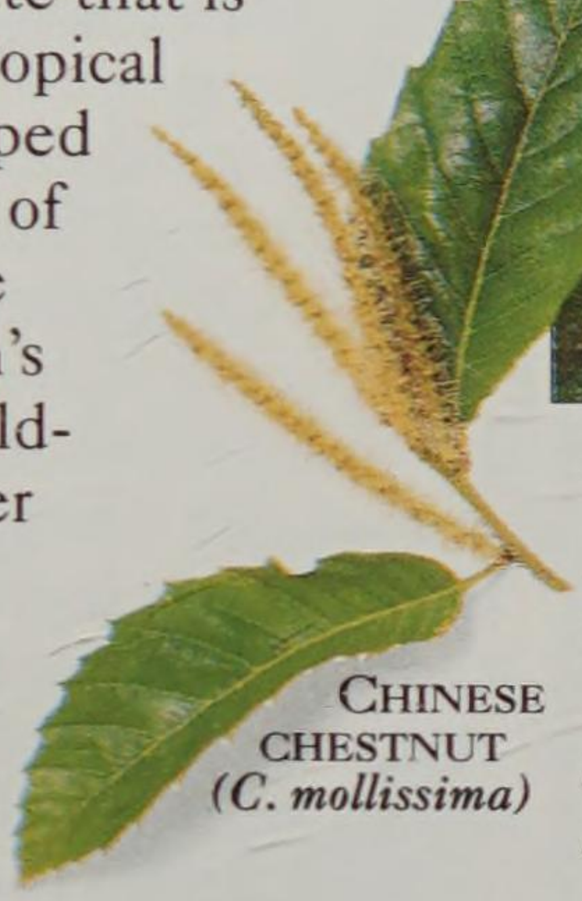
ORIENTAL BEECH (*Fagus orientalis*)

Conservation Issues

In recent years, the destruction of the tropical forests has excited a good deal of attention, and rightly so: these last great areas of natural diversity are home to numerous plants and animals, whose continuing existence may be of vital importance to mankind. Faced with so large a debate, it is easy to forget that most forests in temperate zones have already suffered the fate that is threatening those in tropical regions. In the developed world, extensive areas of natural woodland have been lost through man's demand for paper, building materials, and other wood-based products, as well as through the need for agricultural land, creating the relatively unnatural countryside we see today.

In developing parts of the world, temperate woods are still under threat in places like the Himalayas and South America. Particularly in areas of heavy rainfall, the felling of trees – with scant regard to the far-reaching consequences of this action – causes problems such as flooding and mud landslides, when the vegetation that once stabilized entire hillsides is gone.

The majority of species are distributed over a wide enough area to be able to endure partial felling and survive without the danger of extinction. Some have a much more limited range, however. One single example is the Spanish fir *(Abies pinsapo*, see p.56), which grows wild on very few mountainsides in a small area of southern Spain. Years ago, its timber was a valuable local resource. Now, any further cutting might extinguish these glorious forests forever. We must make special efforts to protect this and other such endangered species.



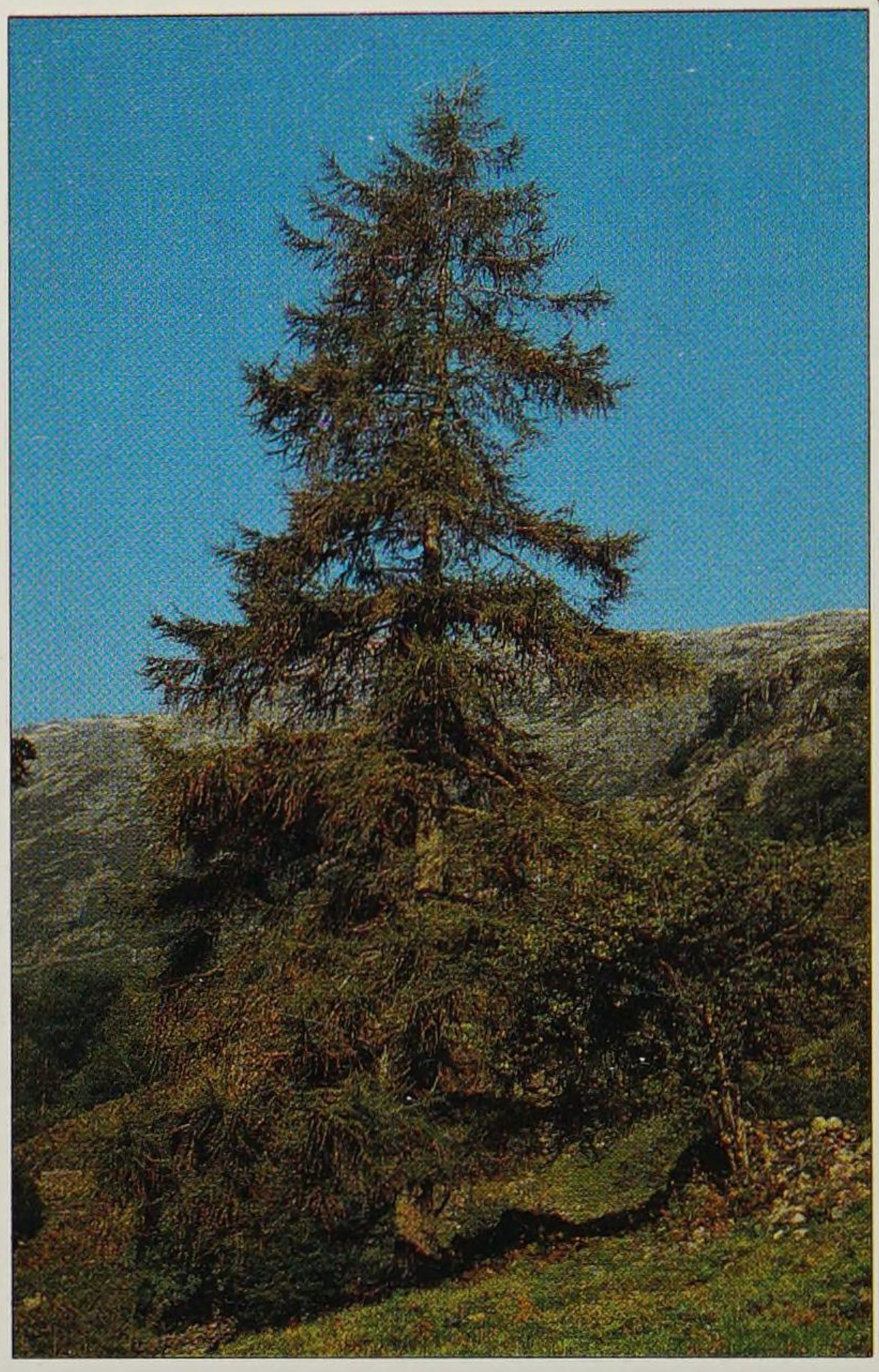
CHINESE CHESTNUT *(C. mollissima)*

Threatened Species

Diseases can nearly destroy a species. Chestnut blight from East Asia has killed all but a few wild American chestnuts (Castanea dentata, *p.149). The Chinese chestnut* (C. mollissima, *p.149) is being used to help breed resistant trees.*

Survivor from China

The bark of Magnolia officinalis *var.* biloba *was once harvested to produce medicines, causing the species to become extinct in the wild. Cultivation has ensured that it still grows in gardens.*



Adaptation for Survival

The larches (Larix, *see pp.60–61) grow wild under the harshest conditions. They produce their foliage on short side shoots – an adaptation that allows them to take advantage of favorable conditions as they come into leaf.*

Habitat and Environment

By adapting to an extensive range of environmental conditions, trees are able to grow in many different habitats. Generally speaking, it is the conifers that inhabit the most hostile situations. Their slender shape minimizes damage by snow; evergreen leaves make the best use of a growing season that may be short and mean that the plant can survive extended periods of drought when the ground is frozen; wind pollination eliminates the need for insect visitors, which may be sparse or nonexistent in unfavorable habitats.

Friendlier habitats produce a longer growing season and encourage deciduous species. Here, the plant has time to produce new leaves, and shed old ones, every year in a continuous cycle of regeneration. In shady places, large leaves are needed to intercept as much sunlight as can filter through; in wet areas, tapered tips allow for the rapid shedding of water; in dry areas, gray or silvery leaves reduce water loss; and fragrant or showy flowers ensure a good chance of pollination by insects.

ILEX x KOEHNEANA ▷

◁ LUSTERLEAF HOLLY (*Ilex latifolia*)

△ PARENT ONE
Lusterleaf holly (Ilex latifolia, *see p.112) has rather large leaves, which are toothed at the margin but not spiny.*

THE HYBRID ▷
Ilex x koehneana *(see p.112) has the large leaves of* I. latifolia. *The spiny margin of the leaves is inherited from* I. aquifolium.

Hybrid Plants

A hybrid is produced when two different species cross together. The plant that results usually shows characteristics that are intermediate between the two parents. Some hybrids occur only through cultivation in gardens, because the parent plants do not grow together in the wild.

◁ ENGLISH HOLLY (*Ilex aquifolium*)

△ PARENT TWO
The familiar English holly (Ilex aquifolium, *see p.109) has leaves that are typically edged with spiny teeth.*

A Family Tree

Family
A family contains a single genus or several related genera. The family name is always written in roman type, e.g., Rosaceae.

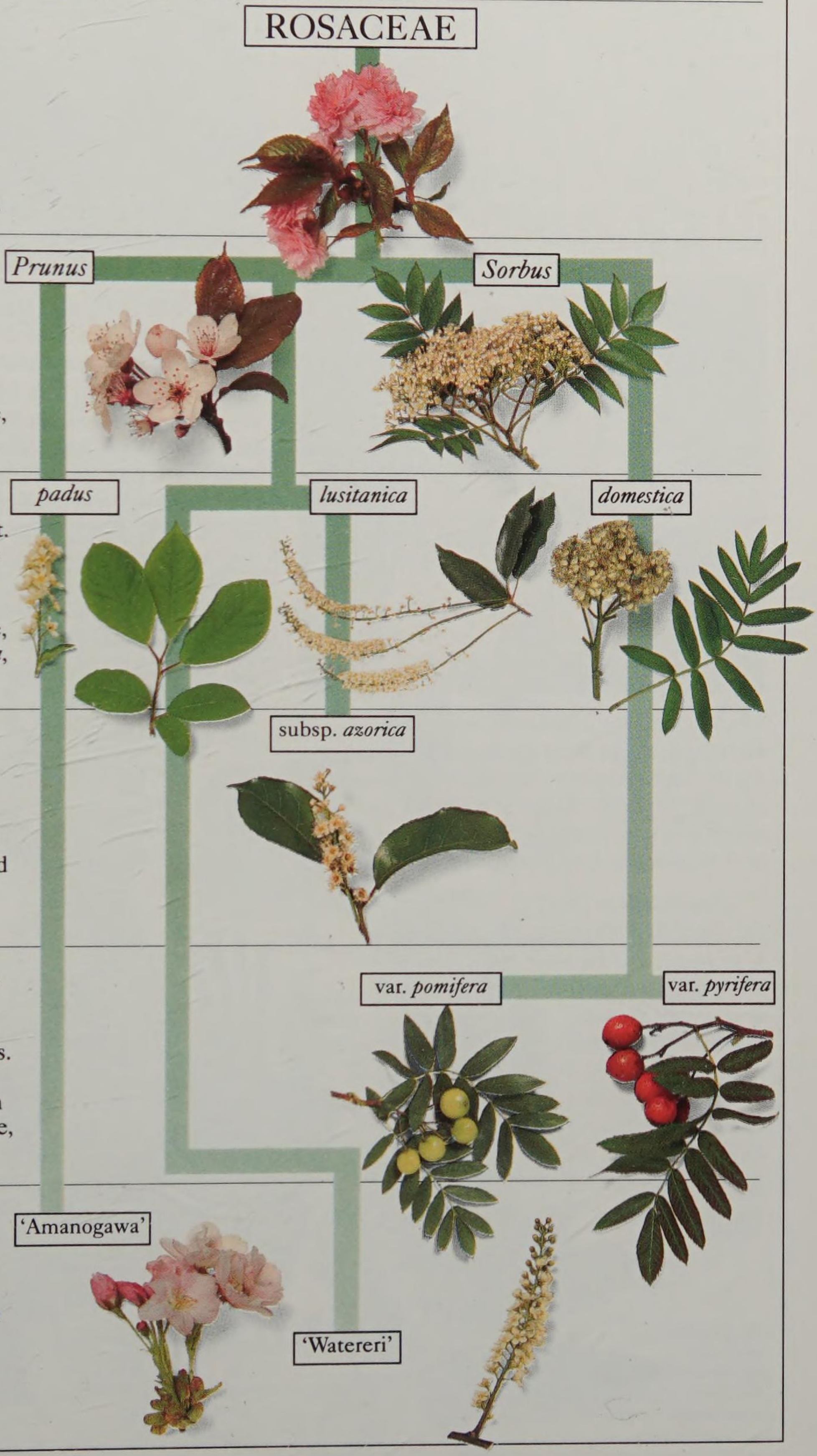
Genus, Genera
A genus contains a single species or several related species. The genus element is always written in italic type, e.g., *Prunus*, *Sorbus*.

Species
A species is one unit. It denotes a specific plant. The species element is always written in italic type, e.g., *padus*, *lusitanica*, *domestica*.

Subspecies
A subspecies is a major division of a species. The two elements are always written in roman and italic type, e.g., subsp. *azorica*.

Variety & Forma
Variety (var.) and forma (f.) are minor divisions of a species. The two elements are always written in roman and italic type, e.g., var. *pomifera*.

Cultivar
A cultivar is a form selected and named for its garden merit. The name is written in roman type, with quotation marks, e.g., 'Watereri.'



Observing and Recording Trees

Keeping written notes about the trees you see is not only an enjoyable activity at the time: it also makes interesting reading at a later date. Choose half a dozen favorite trees close to where you live or work. Visit each one several times during the four seasons and build up a fact file that records their special features at different times of the year.

Measuring a Tree's Height

Cut a straight piece of stick that is the same length as the distance between your eye and your fist. Hold it vertically at arm's length and walk toward or away from the tree to align the top of the stick with the top of the tree and the base of the stick with the base of the tree. Mark the point at which you are now standing and measure the distance on the ground to the base of the trunk. This distance equals the height of the tree.

Making Bark Impressions

Rubbing bark can be an effective way of capturing its diverse patterns and textures. Hold a piece of paper flat to the surface of the trunk, and rub lightly with a wax crayon. Label your rubbing with the date, the tree's name, and its location.

Taking Field Notes

Jot down the tree's height, the circumference of its trunk, and the color and texture of the bark. Note details of its leaves, flowers, and fruit (depending on the time of year), its location, and the date. Expand your notes at home.

long, 100 ft (30 m) tape for measuring height, and trunk circumference

colored pencils for making sketches

small sketchbook for visual notetaking

reference photographs

wax crayon and paper for making bark impressions

cut specimen to take home for more detailed examination

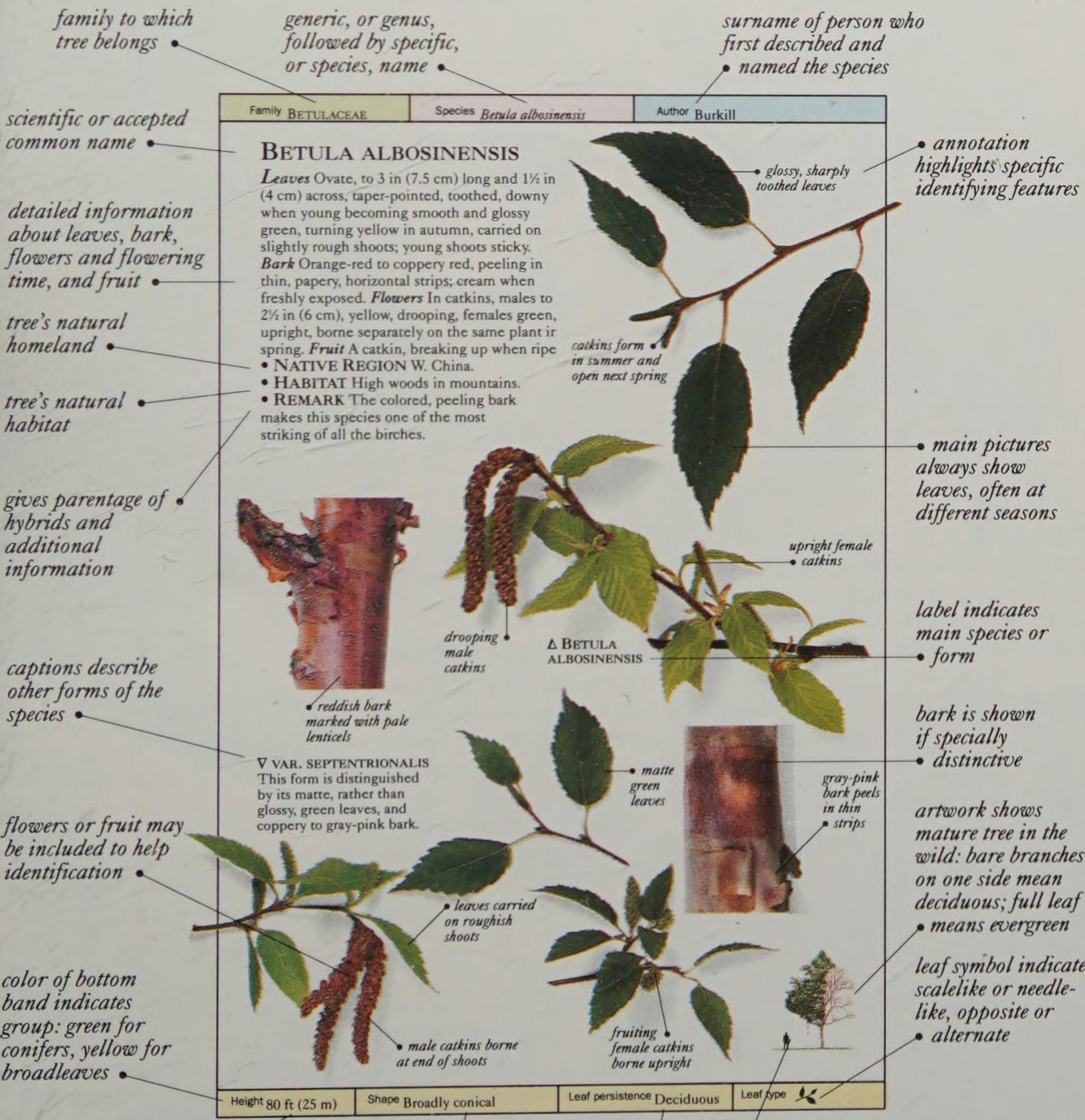
label with string tie for cut specimens

magnifying glass

How This Book Works

THE BOOK IS ARRANGED according to the major groups of tree: Conifers and their Allies, and Broadleaves. The groups are divided, alphabetically, into families. A short introduction to each family tells you how many genera and species it contains, and describes the general characteristics and features of the plants that belong to it. The entries that follow are arranged alphabetically by genus and by species within each genus. They give detailed information, in words and pictures, about selected species that are found in that family.

Each entry begins with the common name, or the scientific name if there is no single, accepted common name for that plant. Many plants do not have a common name: indeed, they are well enough known under their scientific name not to need one. This example shows how a typical entry is organized.



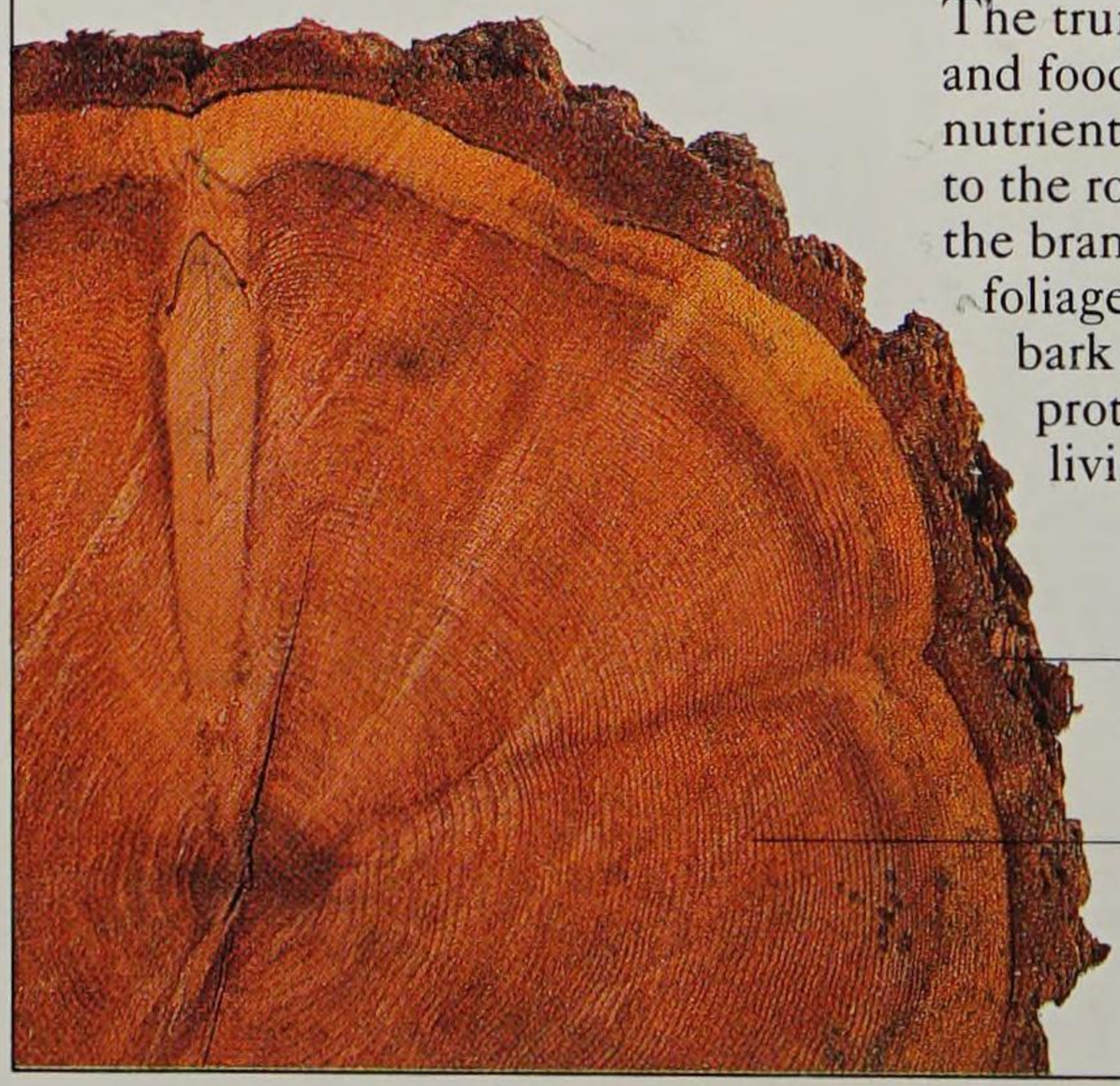
WHAT IS A TREE?

A TREE IS a living thing. It has a woody stem, a root system, and branches that are clothed in season with leaves. It may have flowers and, later, fruit.

Size and habit distinguish a tree from a shrub. A tree usually attains at least 17 ft (5 m) and has a single stem that may divide; a shrub is usually smaller and has many stems growing from the base. Habit is related to habitat. A species that is a tallish tree in a fertile valley may be only a low shrub on an exposed hillside. Open situations allow the plant to develop a spreading crown; in dense forest, where the trees are crowded, it may form a narrower shape.

LEAVES

Chlorophyll is the pigment that makes leaves green. It enables the plant to convert water and carbon dioxide into sugars and oxygen, using the energy from sunlight (photosynthesis).



TRUNK AND BARK

The trunk conducts water and food to the leaves, and nutrients from the leaves to the roots. It supports the branches and their foliage. The layer of bark on the outside protects the delicate living tissues beneath.

ROOT SYSTEM

A mature tree has large, main roots that anchor it into the ground and support it. The surrounding network of very fine roots takes up water and minerals for transporting to its actively growing parts.

BUDS AND SHOOTS

Young leaf growths inside a layer of scales form buds on the shoots during winter. The scales protect the young leaves until they are ready to expand in spring. The shoots carry water and nutrients and support the leaves.

buds are arranged opposite or alternate, just like leaves

distinctively colored buds and shoots can help to identify deciduous species in winter

young shoots can be covered in a whitish bloom

FLOWERS

The flowers produce pollen and receive it from other plants. It is usually transferred by wind or insect activity. Successful pollination results in the formation of seed-containing fruit.

tiny flowers may hang in racemes

showy flowers attract insects

conifers have separate male and female flowers

female flowers

male flowers

flowers may be in catkins

FRUIT

The fruit protects the seeds as they ripen, and helps to disperse them when they are mature. Fleshy fruit is usually eaten by animals, which travel and spread the seeds; dry, winged fruit is carried away by wind.

fleshy fruits are often brightly colored

cones carry their seeds exposed on their scales

dry, winged fruits

some fruits have only one seed

a nut has a hard outer shell

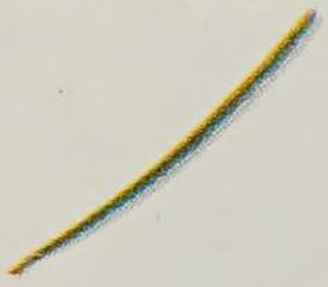
seeds may be inside conelike scales

THE PARTS OF A TREE

BECOMING FAMILIAR with the principal parts of a tree, and their variety, can help you identify trees at any season of the year; and it is useful to recognize the special words that describe them. These pages illustrate typical leaves, flowers, fruit, and bark. If you can relate the words to the pictures, you can see in your mind what the parts of the tree look like as you read the entries.

TEN BASIC LEAF SHAPES

Leaves occur in a great variety of shapes; each also has variations within its basic shape. Every leaf may not fit exactly into one of the shapes shown below: it may be between two different ones. These shapes apply not only to simple leaves, but also to the individual leaflets of compound leaves. A simple leaf is one that is not divided into separate parts. A compound leaf is divided into two or more parts: each separate division is known as a leaflet.



Needlelike leaves are parallel-sided and taper-pointed.

Linear leaves are parallel-sided and have a blunt tip.

Rounded leaves are more or less circular in outline.

Oblong leaves are parallel-sided or nearly so.

Elliptic leaves are broad, narrowing at each end.

Heart-shaped leaves have a deep notch at the base.

Ovate leaves are widest below the middle.

Obovate leaves are widest above the middle.

Lanceolate leaves are slender and widest below the middle.

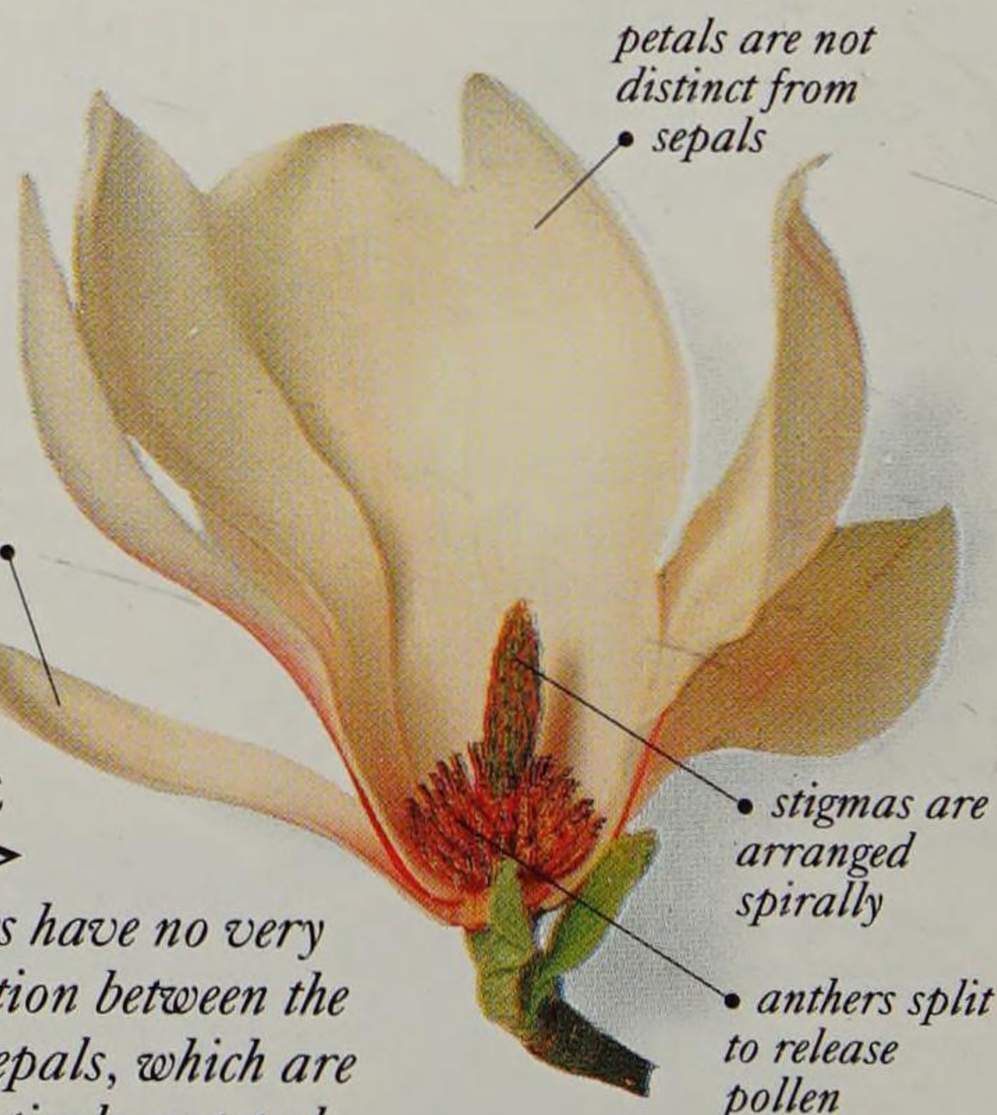
Oblanceolate leaves are slender and widest above the middle.

THE PARTS OF A FLOWER

Whereas leaves may vary greatly within any one genus, the flowers of related species and genera are usually similar, at least in structure. Those found on trees are often small, sometimes insignificant and without petals, or even inconspicuous; alternatively, they can be large and showy. Some tree flowers are fragrant; some smell unpleasant; some have no scent at all. How they are borne – singly or together in clusters – is also a notable identifying feature.

ADVANCED FLOWER ▷

Most flowers are of this type. They have petals that are usually distinct from the sepals.

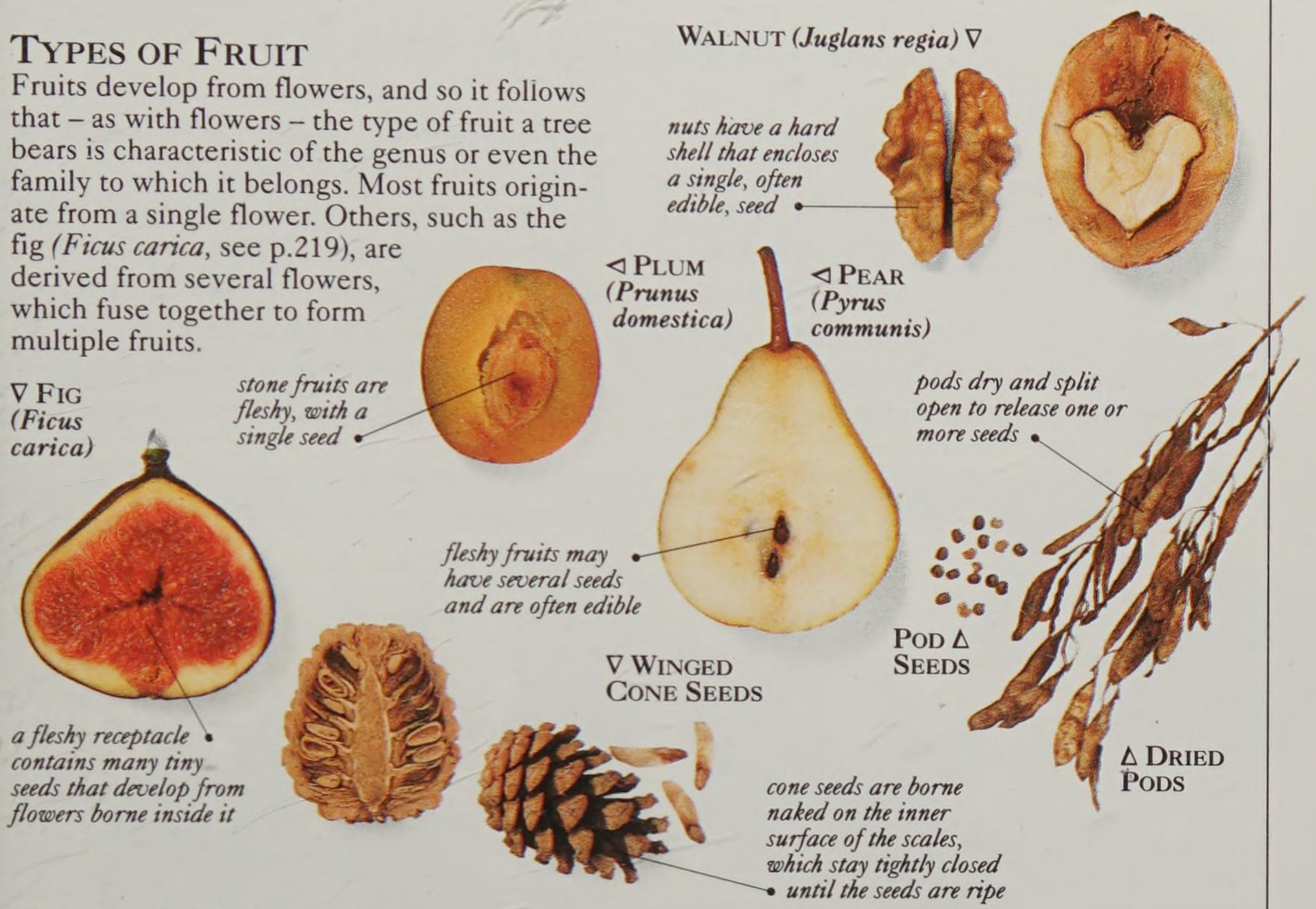


PRIMITIVE FLOWER ▷

These flowers have no very clear distinction between the petals and sepals, which are known collectively as tepals.

Types of Fruit

Fruits develop from flowers, and so it follows that – as with flowers – the type of fruit a tree bears is characteristic of the genus or even the family to which it belongs. Most fruits originate from a single flower. Others, such as the fig *(Ficus carica*, see p.219), are derived from several flowers, which fuse together to form multiple fruits.



Types of Bark

Trees develop their characteristic bark patterns and textures as a means of dealing with the increasing circumference of the trunk as they grow. Because the outer bark is composed of dead cells, it cannot grow and so, as the trunk expands, the bark cracks or peels in various ways. Bark is a useful feature in identification, since it can be used at any time of the year.

Smooth bark is a feature of many young trees. It may crack or peel as they age.

Plates are irregular areas of bark, often flaking, with fissures or cracks in between.

Ridges and fissures may develop as thick bark cracks. They can be raised and prominent or deep.

Vertically peeling bark often hangs and falls from the tree in long strips and ribbons.

Horizontally peeling bark may unwind from the tree in paper-thin strips and wide sheets.

Irregularly flaking bark reveals different age layers and gives the trunk a shaggy appearance.

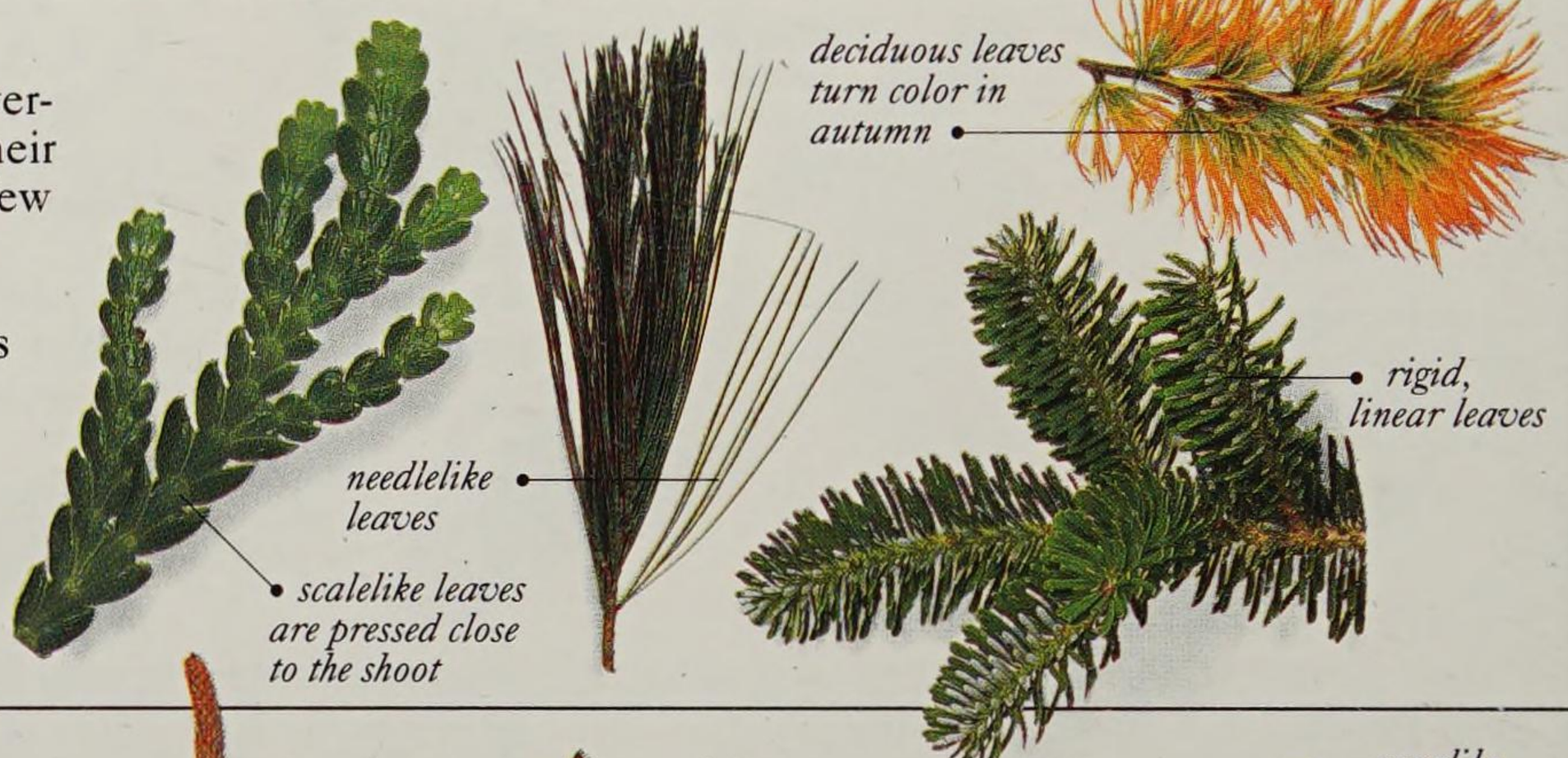
CONIFER OR BROADLEAF?

IN ORDER TO DISCOVER all there is to know about a specific tree, scientists often use microscopic characters that are not visible to the naked eye. These provide vital, yet hidden, clues toward the positive identification of a species (although even scientists can, and do, make mistakes). But for most people, careful, detailed observation of what is immediately visible must do. If you can recognize the distinctive features that categorize the two major groups, it is easy to distinguish conifers and their allies from broadleaves, and vice versa. The main characteristics are described and illustrated on these two pages.

CONIFERS AND THEIR ALLIES

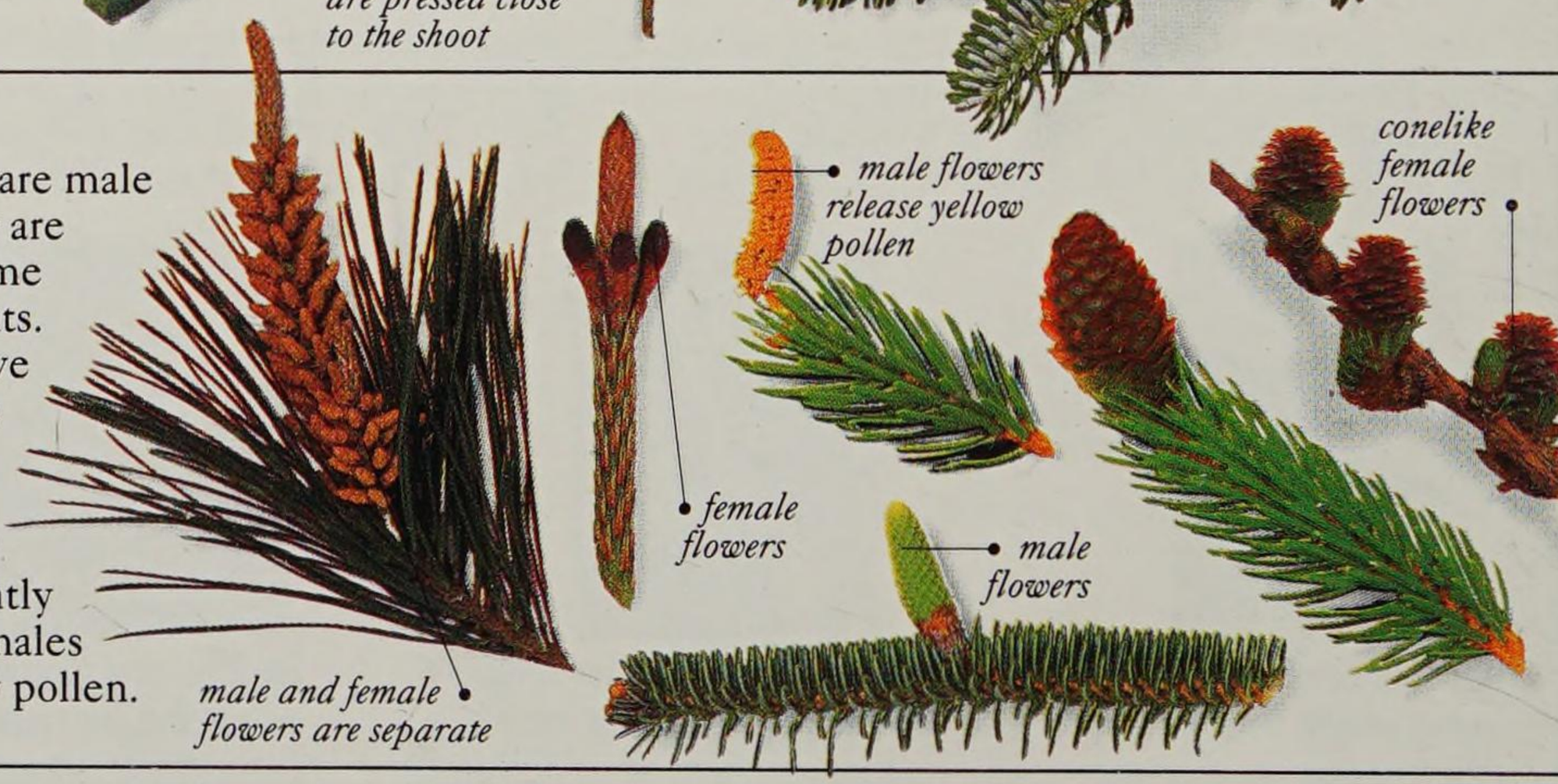
LEAVES

Most conifers are evergreen: they retain their leaves in winter. A few are deciduous: they renew their leaves annually. The leaves are usually narrow and sharp-pointed or small and scalelike. The foliage is often sweet and aromatic.



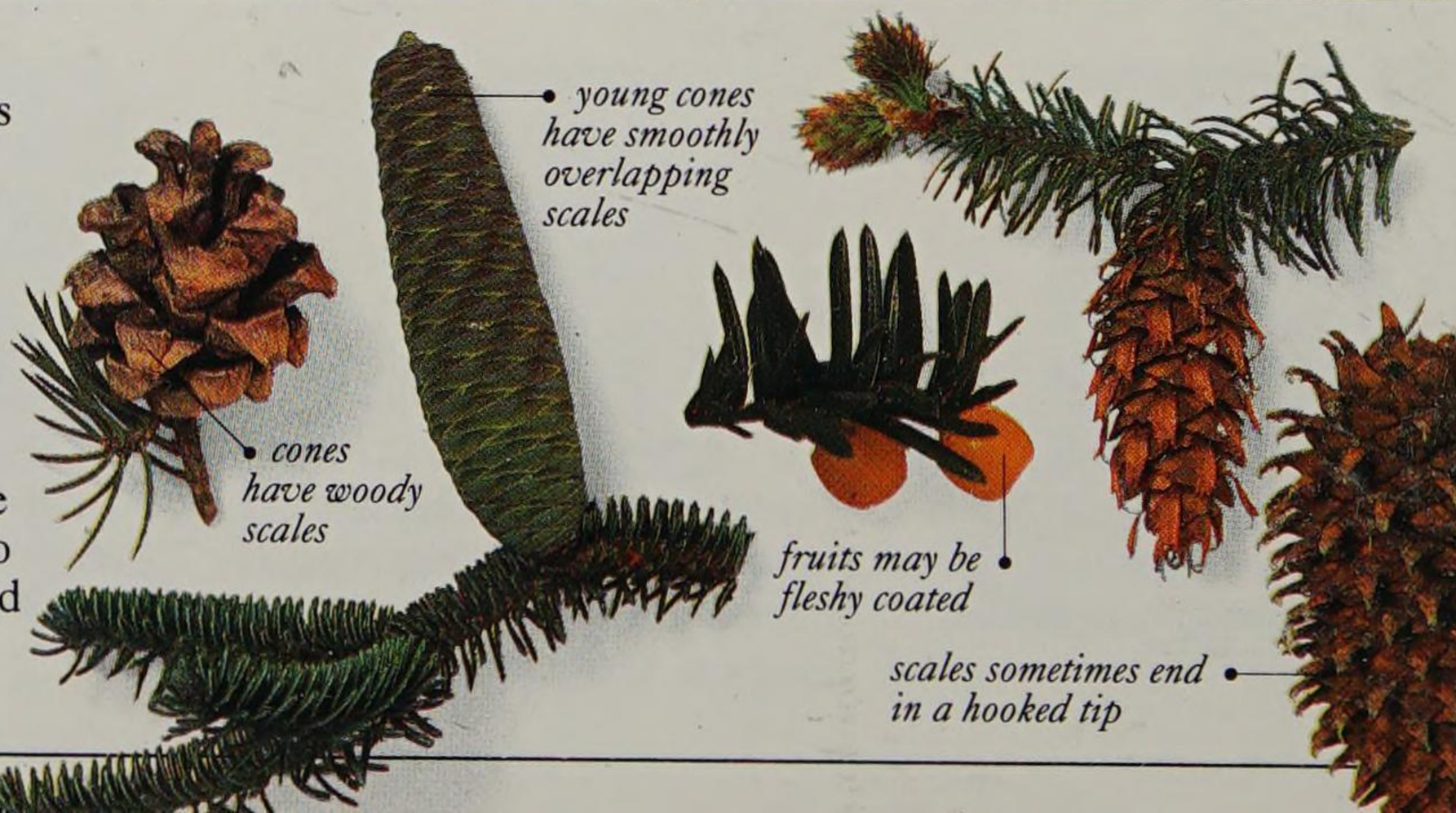
FLOWERS

Conifer flowers are male or female. They are borne on the same or different plants. They do not have petals, yet some can be quite ornamental. Female flowers often have brightly colored scales; males release powdery pollen.

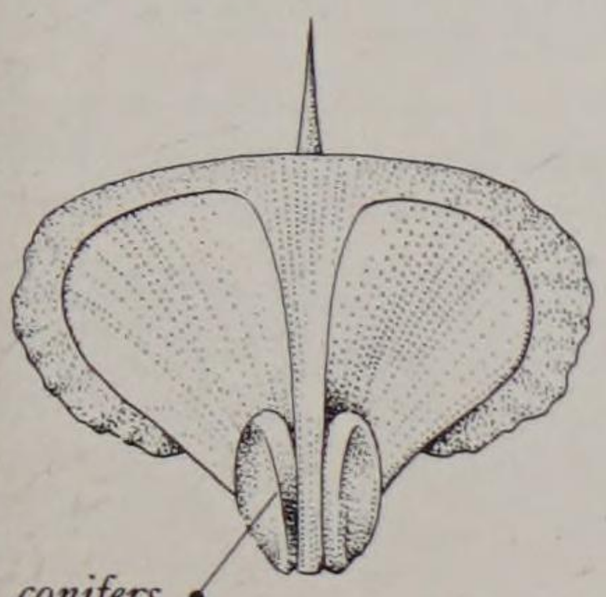


FRUIT

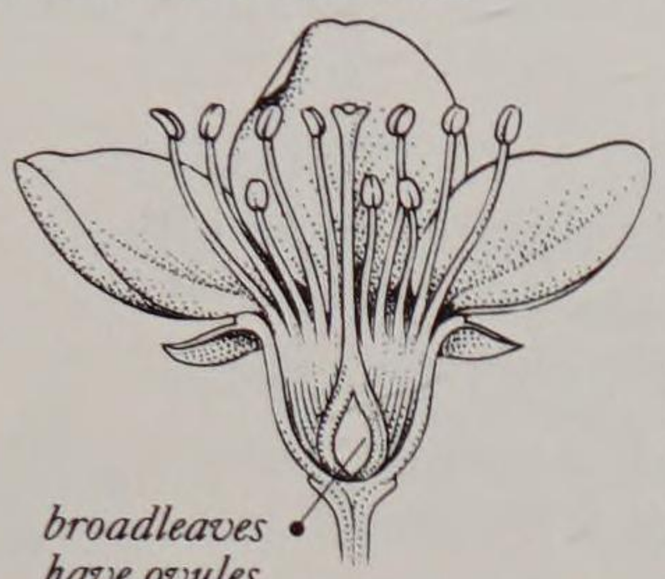
The fruit of most conifers is a cone, composed of often woody scales, and colored brown when ripe. Juniper species have fleshy scales, so the fruit resembles a berry. Conifer allies, such as yews, are not true conifers but are related to them. Their fruit is a seed with a fleshy outer coat.



THE BOTANICAL DIFFERENCE



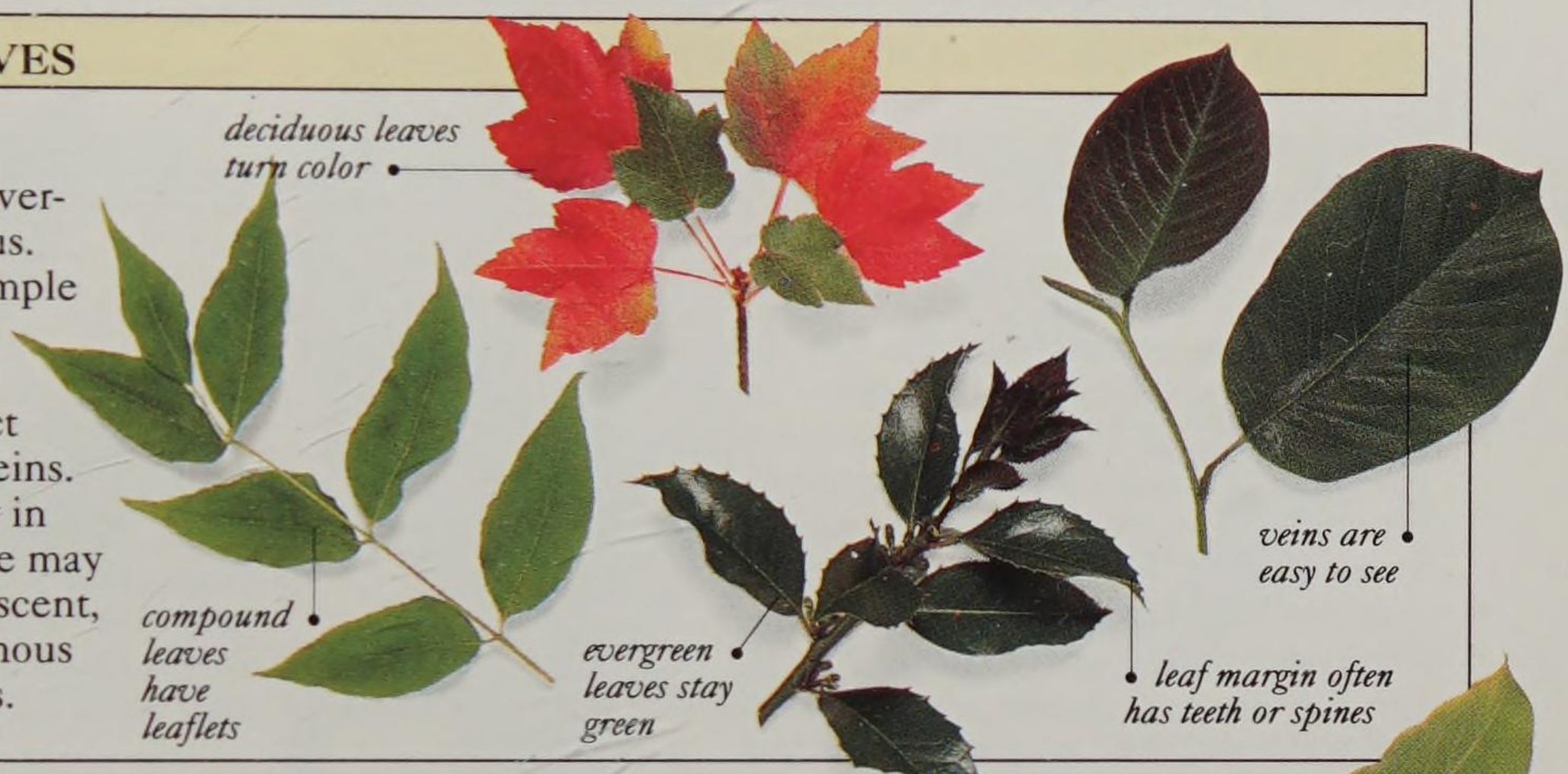
CONIFERS
Conifers and their allies are classed as gymnosperms: plants with naked seeds not enclosed in an ovary. They are considered to be more primitive than broadleaves.



BROADLEAVES
Broadleaves are classed as angiosperms: plants with ovules enclosed for protection in an ovary. Following successful fertilization, the ovules develop into seeds.

BROADLEAVES

LEAVES
Broadleaves are evergreen or deciduous. The leaves are simple or compound, usually flattened and have a distinct network of fine veins. They vary greatly in shape. The foliage may have an aromatic scent, but lacks the resinous quality of conifers.



FLOWERS
Broadleaf flowers are usually bisexual: male and female parts are in the same flower. Separate males and females are borne on the same or on different plants. Both types usually have petals, and are often fragrant. They can be small or large.

FRUIT
The fruit of broadleaves has much more diversity than that of most conifers, and comes in many forms. It may be a berry, acorn, capsule, nut, or pod; woody, fleshy-coated, or dry; spiny, rough, or smooth; inedible or edible; and any color when ripe.

TREE IDENTIFICATION KEY

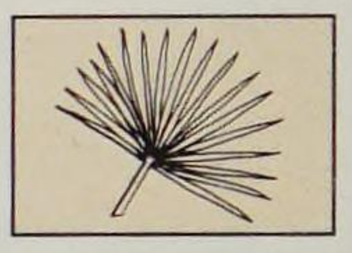
THE KEY on pages 18 to 33 uses leaf characteristics to help you to identify the trees that are described in this book. **Stage 1** (see right) establishes whether your tree is a conifer, broadleaf, or palm. **Stage 2** divides conifers and broadleaves into groups, according to leaf type. **Stage 3** divides each of these groups into more detailed groups that each contain two or more genera.

STAGE 1: WHICH GROUP?

The trees are divided into two major groups: Conifers, and Broadleaves (including Palms).
Conifer features are described on page 16.
Broadleaf features are described on page 17.
Palm features are described on page 19.

CONIFER

BROADLEAF



PALM

STAGE 2: CONIFERS – DECIDUOUS OR EVERGREEN?

Only a few conifer species in this book are deciduous; most are evergreen. Deciduous species lose their leaves in autumn. In spring, their pale young leaves are clearly visible. Evergreens keep their leaves in winter, so they are easy to distinguish. In spring, look for pale young leaves together with dark old leaves. If your tree is deciduous, turn to pages 20–21. If it is evergreen, decide whether your leaf is not scalelike or is scalelike, then turn to pages 20–21 or 22–23.

DECIDUOUS

- *Ginkgo* 20
- *Larix* 20
- *Pseudolarix* 20
- *Glyptostrobus* 21
- *Metasequoia* 21
- *Taxodium* 21

LEAVES NOT SCALELIKE

- *Clustered or in whorls* 20–21
- *Single, shoots hidden* 20–21
- *Single, shoots not hidden, one-year stems green* 20–21
- *Single, shoots not hidden, one-year stems not green* 20–21

EVERGREEN

CONIFERS

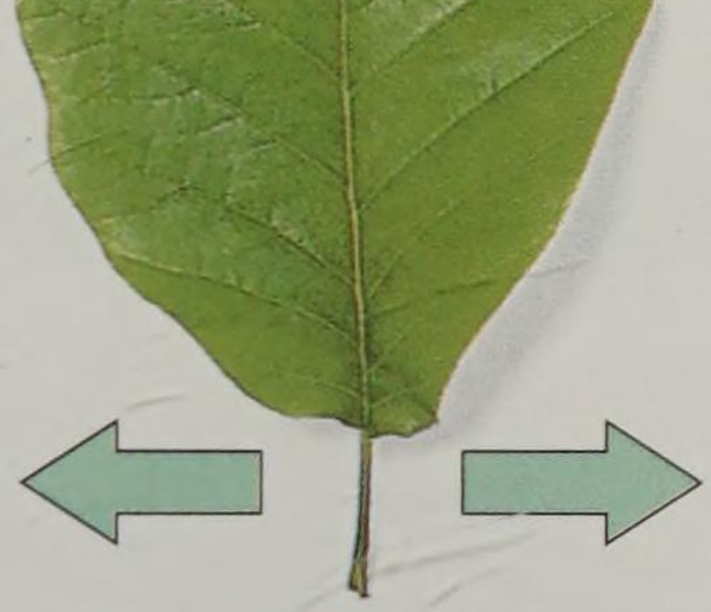
AT LEAST SOME LEAVES SCALELIKE

- *Foliage in flattened sprays* 22–23
- *Foliage in irregular sprays* 22–23

STAGE 2: BROADLEAVES – OPPOSITE OR ALTERNATE LEAVES?

All broadleaves have their leaves arranged in one of two ways: either opposite or alternate. Opposite leaves are borne in pairs or threes, one directly opposite the other, on either side of the stem. Alternate leaves are borne singly, staggered on alternate sides of the stem. Leaflets are opposite or alternate, too. If your leaf is opposite, turn to pages 22–25. If it is alternate, turn to pages 24–33.

OPPOSITE



ALTERNATE

BROADLEAVES

OPPOSITE COMPOUND

- *Leaves toothed or lobed* 22–23
- *Leaves untoothed* 24

OPPOSITE SIMPLE

- *Leaves toothed* 24–25
- *Leaves untoothed* 24–25
- *Leaves lobed* 24

ALTERNATE COMPOUND

- *Leaves pinnate, toothed* 24–27
- *Leaves pinnate, untoothed* 26–27
- *Leaves bipinnate, toothed* 26
- *Leaves bipinnate, untoothed* 26
- *Leaves with three leaflets* 26

ALTERNATE SIMPLE

- *Leaves untoothed, evergreen* 28–29
- *Leaves untoothed, deciduous* 28–29
- *Leaves lobed, toothed* 30–31
- *Leaves lobed, untoothed* 30–31
- *Leaves unlobed, toothed, evergreen* 30–31
- *Leaves unlobed, toothed, deciduous* 32–33

STAGE 2: PALMS

Palms are often tree-like in habit but are not true trees. They have a single, unbranched stem that does not increase in girth with age, and distinctively divided leaves. Most palms are native to warm regions, but some species grow in warm temperate regions, such as the Mediterranean and the southern United States. Chusan palm *(Trachycarpus fortunei)*, included in this book of largely temperate plants as an example of palms, is the hardiest species. If your leaf belongs to this palm, turn to page 31.

PALMS

STAGE 3: CONIFERS

This final stage in the identification key will guide you quickly to the correct section of the book. If you have turned straight to this part of the key, go back to pages 16 and 17, where the main characteristics that distinguish conifers and their allies, and broadleaves, from each other are illustrated and described. Having noted these features, move on to pages 18 and 19 and read through Stages 1 and 2 of the key. Now you are all set to start Stage 3.

Each individual leaf in the key represents a genus. You have already decided which type of conifer leaf you have – whether it is deciduous or evergreen, not scalelike or scalelike. You will

CONIFERS	LEAVES DECIDUOUS	Leaf type: not scalelike

Leaves renewed annually

Ginkgo **51**

Larix **60–61**

Pseudolarix **76**

CONIFERS	LEAVES EVERGREEN	Leaf type: not scalelike

Leaves clustered or in whorls

Fitzroya **44**

Juniperus **44–48**

Cedrus **58–59**

Leaves single, young shoots hidden by leaves or leaf bases

Araucaria **34**

Athrotaxis **80**

Cryptomeria **80**

Leaves single, young shoots not hidden, one-year stems green

Cephalotaxus **34–35**

Podocarpus **78**

Saxegothaea **78**

see that each large group has been further divided into several smaller groups. These give you an additional layer of information, which points you to finer detail, for example, whether the leaves are borne in clusters or whorls, or singly. Compare your leaf carefully with the leaves shown in the bands of each section, and decide to which group your leaf belongs. Compare your leaf with those in the final group, and find the individual leaf that it most closely resembles. The genus to which it belongs is written below the photograph of the leaf. Turn to the page(s) indicated beside the genus name to find the relevant species entry or entries.

Glyptostrobus 81

Metasequoia 81

Taxodium 83

Pinus 66–75

Sciadopitys 82

Sequoia 82

Sequoiadendron 82

Taiwania 83

Taxus 79

Torreya 79

Cunninghamia 81

CONIFERS	LEAVES EVERGREEN	Leaf type: at least some leaves scalelike

Leaves single, young shoots not hidden, one-year stems not green

Abies **52–57**

Picea **62–65**

Pinus monophylla **70**

Foliage in flattened sprays

Austrocedrus **35**

Calocedrus **36**

Chamaecyparis **37–39**

Foliage in irregular sprays

Cupressus **41–43**

Juniperus **44–48**

STAGE 3: BROADLEAVES

This final stage in the identification key will guide you quickly to the correct section of the book. If you have turned straight to this part of the key, go back to pages 16 and 17, where the main characteristics that distinguish conifers and their allies, and broadleaves, from each other are illustrated and described. Having noted these features, move on to pages 18 and 19 and read through Stages 1 and 2 of the key. Now you are all set to start Stage 3.

Each individual leaf in the key represents a genus. You have already decided which type of broadleaf leaf you have – whether it is opposite or alternate, compound or simple. You will see

BROADLEAVES	LEAVES OPPOSITE	Leaf type: compound

Leaves toothed or lobed

Acer **84–104**

Eucryphia **146–148**

Aesculus **178–181**

Pseudotsuga **76**

Tsuga **77**

× *Cupressocyparis* **40**

Cupressus cashmeriana **41**

Thuja **49–50**

Thujopsis **51**

that each large group has been further divided into several smaller groups. These give you an additional layer of information, which points you to finer detail, for example, whether the leaves are toothed, untoothed, or lobed, evergreen or deciduous. Compare your leaf carefully with the leaves shown in the bands of each section, and decide to which group your leaf belongs. Compare your leaf with those in the final group, and find the individual leaf that it most resembles. The genus to which it belongs is written below the leaf photograph. Turn to the page(s) indicated beside the genus name to find the relevant entry or entries.

Fraxinus **228–230**

Leaves untoothed

Phellodendron **283**

Tetradium **284**

BROADLEAVES	LEAVES OPPOSITE	Leaf type: simple

Leaves toothed

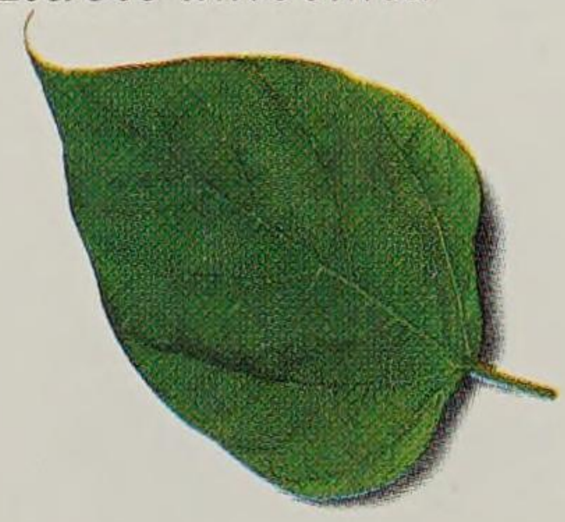
Acer **84–104**

Euonymus **132**

Cercidiphyllum **133**

Eucryphia **146–148**

Leaves untoothed



Catalpa **129–131**

Buxus **131**

Cornus **133–138**

Eucryphia **146–148**

Leaves lobed

Acer **84–104**

Catalpa **129–131**

Paulownia **296**

BROADLEAVES	LEAVES ALTERNATE	Leaf type: compound

Leaves pinnate, toothed

Rhus **105–106**

Carya **182–183**

Juglans **183–185**

Platycarya **185**

Chionanthus 227–228

Phillyrea 231

Rhamnus cathartica 237

Eucalyptus 222–225

Myrtus 225

Chionanthus 227–228

Ligustrum 231

Pterocarya 186–187

Gleditsia 195

Toona 217

Sorbus 274–282

Zanthoxylum **285**

Koelreuteria **295**

Xanthoceras **295**

Leaves pinnate, untoothed

Rhus trichocarpa **106**

Juglans regia **185**

Cladrastis **194**

Leaves bipinnate, toothed

Aralia **114**

Gleditsia **195**

Leaves bipinnate, untoothed

Acacia **190–191**

Albizia **192**

Gymnocladus **195**

Leaves with three leaflets

\+ *Laburnocytisus* **196**

Laburnum **197–198**

Ptelea **28**

Ailanthus **296**

Maackia **198**

Robinia **199**

Sophora **200**

BROADLEAVES	LEAVES ALTERNATE	Leaf type: simple

Leaves untoothed, evergreen

Ilex **108–113**

Arbutus **141–143**

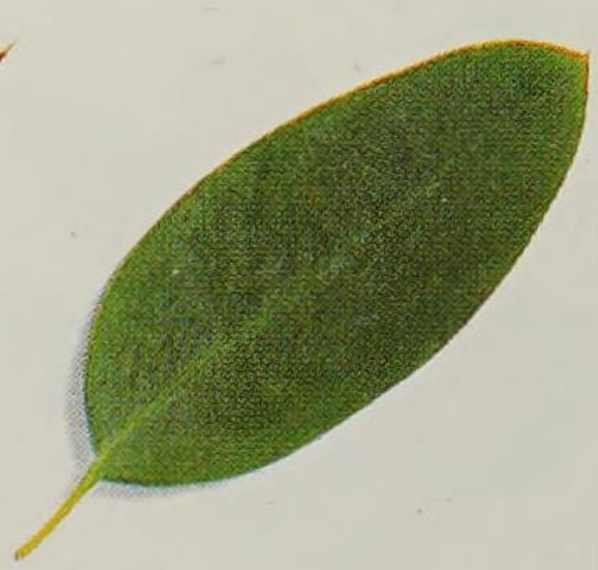
Rhododendron **144**

Chrysolepis **150**

Acacia **191**

Magnolia **202–251**

Callistemon **221**



Eucalyptus **222–225**

Leaves untoothed, deciduous

Cotinus **105**

Asimina **107**

Cornus alternifolia **133**

Diospyros **138–139**

Sassafras **189**

Cercis **192–193**

Genista **194**

Magnolia **202–215**

Cotoneaster **240**

Cydonia **244**

Mespilus **255**

Pyrus salicifolia **273**

Lithocarpus **154**

Quercus ilex **163**

Laurus **188**

Umbellularia **189**

Pittosporum **233**

Embothrium **236**

Drimys **310**

Elaeagnus **140**

Hippophae **140**

Fagus **151–153**

Quercus **158–173**

Maclura **220**

Nyssa **226–227**

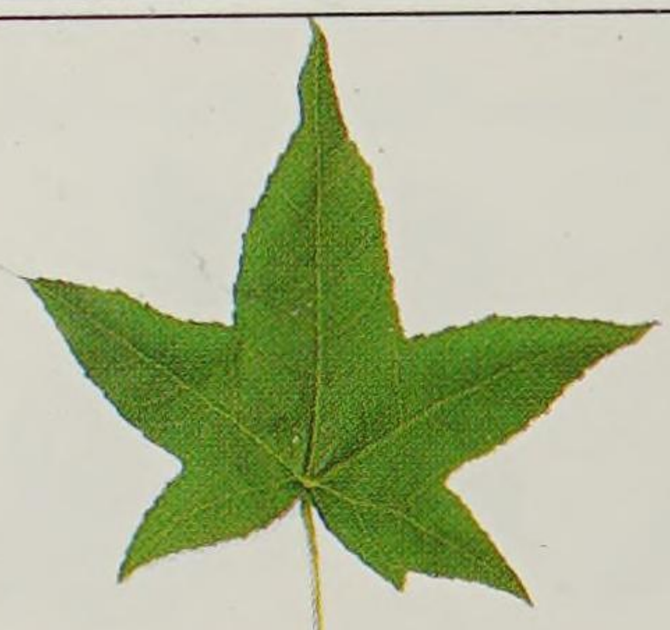
Embothrium **236**

Rhamnus frangula **237**

Leaves lobed, toothed

Kalopanax **115**

Quercus **158–173**



Liquidambar **175–176**

Broussonetia **218**

x *Crataemespilus* **244**

Malus **245–254**

Sorbus **274–282**

Populus alba **286**

Leaves lobed, untoothed

Quercus **158–173**

Sassafras **189**

Liriodendron **201**

Leaves unlobed, toothed, evergreen

Ilex **108–113**

Pseudopanax **115**

Maytenus **132**

Azara **174**

Photinia **256–257**

Prunus **265**

Ficus **219**

Morus **220**

Platanus **234–235**

Crataegus **240–243**

Tilia mongolica **304**

Trachycarpus **232**

Arbutus **141–143**

Nothofagus **155–157**

Quercus **158–173**

Trochodendron **306**

Leaves unlobed, toothed, deciduous

Alnus **116–117**

Betula **118–125**

Carpinus **126–127**

Corylus **127**

Fagus **151–153**

Nothofagus **155–157**

Quercus **158–173**

Idesia **174**

Morus **220**

Davidia **226**

Amelanchier **238–239**

Crataegus **240–243**

Pyrus **273**

Sorbus **274–282**

Populus **286–290**

Salix **291–294**

Tilia **302–305**

Celtis **306–307**

Ulmus **308–309**

Zelkova **309–310**

Ostrya **128**

Oxydendrum **143**

Eucommia **145**

Castanea **149–150**

Parrotia **177**

Parrotiopsis **177**

Hoheria **216**

Broussonetia **218**

Malus **245–254**

Mespilus **255**

Photinia **256–257**

Prunus **258–272**

Halesia **297**

Pterostyrax **298**

Styrax **298–299**

Stewartia **300–301**

CONIFERS
AND THEIR ALLIES

ARAUCARIACEAE

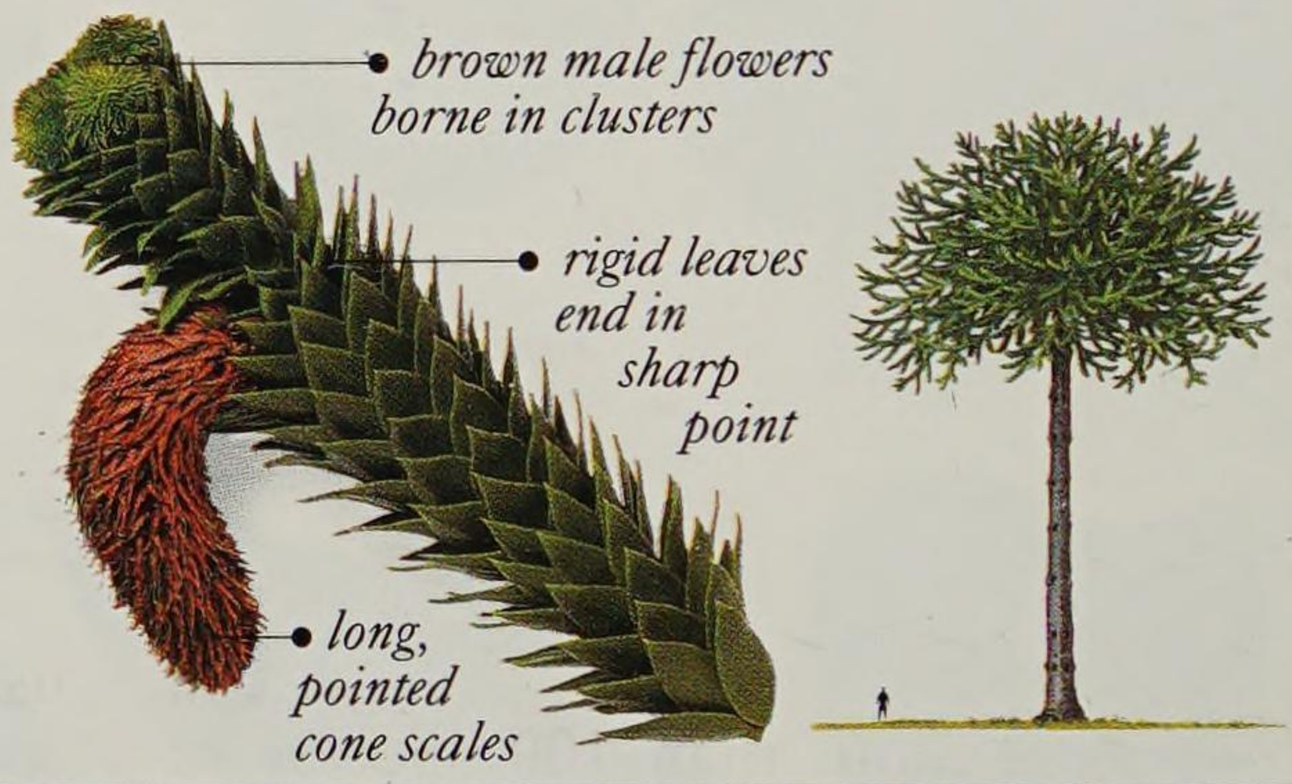
TWO GENERA AND ABOUT 30 species of large, evergreen trees belong to this family. They are mainly native to the southern hemisphere, but extend into Southeast Asia. Many are important timber trees. The monkey puzzle *(Araucaria araucana)* is the best-known member of the family.

Family ARAUCARIACEAE	Species *Araucaria araucana*	Author (Molina) K. Koch

MONKEY PUZZLE

Leaves Ovate, to 2 in (5 cm) long and ¾ in (2 cm) wide, broad at the base, with a spiny tip, glossy dark green, overlapping, all around the shoot. ***Bark*** Gray, wrinkled. ***Flowers*** 4 in (10 cm) long, males brown, clustered, females green-brown, singly, on separate plants in summer. ***Fruit*** An ovoid, brown cone, to 6 in (15 cm) long.

- **NATIVE REGION** Argentina, Chile.
- **HABITAT** Mountains.



Height 164 ft (50 m)	Shape Unique	Leaf persistence Evergreen	Leaf type

CEPHALOTAXACEAE

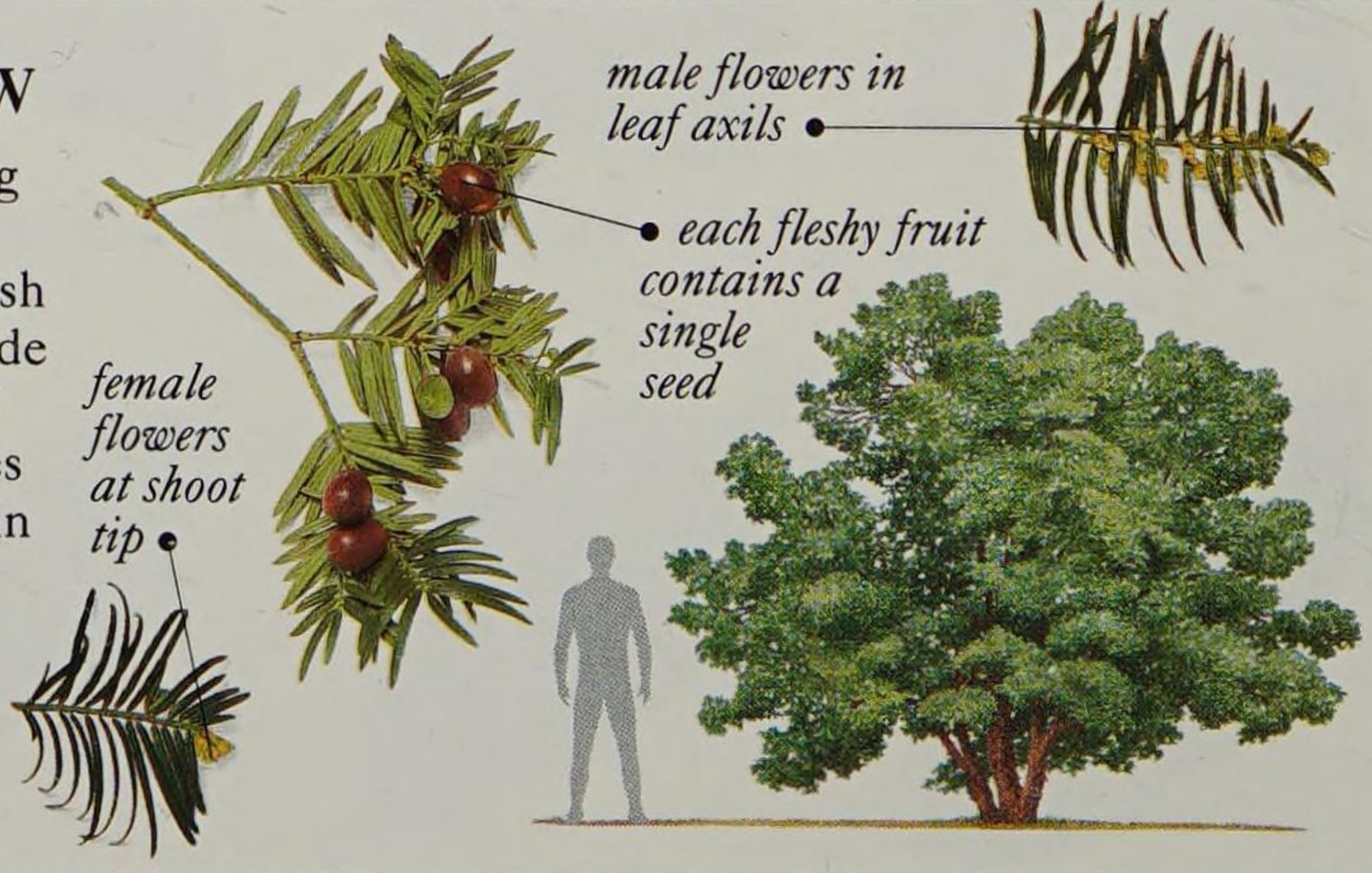
ALTHOUGH FOSSIL EVIDENCE shows that this family was once widely distributed, it is now restricted in the wild to the Far East. The species in the only genus are small trees or large shrubs, with linear leaves and plum-like fruits. Male and female flowers are borne in clusters on separate plants.

Family CEPHALOTAXACEAE	Species *Cephalotaxus fortunei*	Author W.J. Hooker

CHINESE PLUM YEW

Leaves Linear, to 4 in (10 cm) long and ⅛ in (3 mm) across, pointed, glossy green above, with two whitish bands beneath, spreading either side of the shoot. ***Bark*** Red-brown and flaking. ***Flowers*** Males and females creamy yellow, on separate plants in spring. ***Fruit*** Oval, fleshy-coated, purple-brown, 1 in (2.5 cm) long.

- **NATIVE REGION** C. and E. China.
- **HABITAT** Mountain forests.



Height 30 ft (9 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

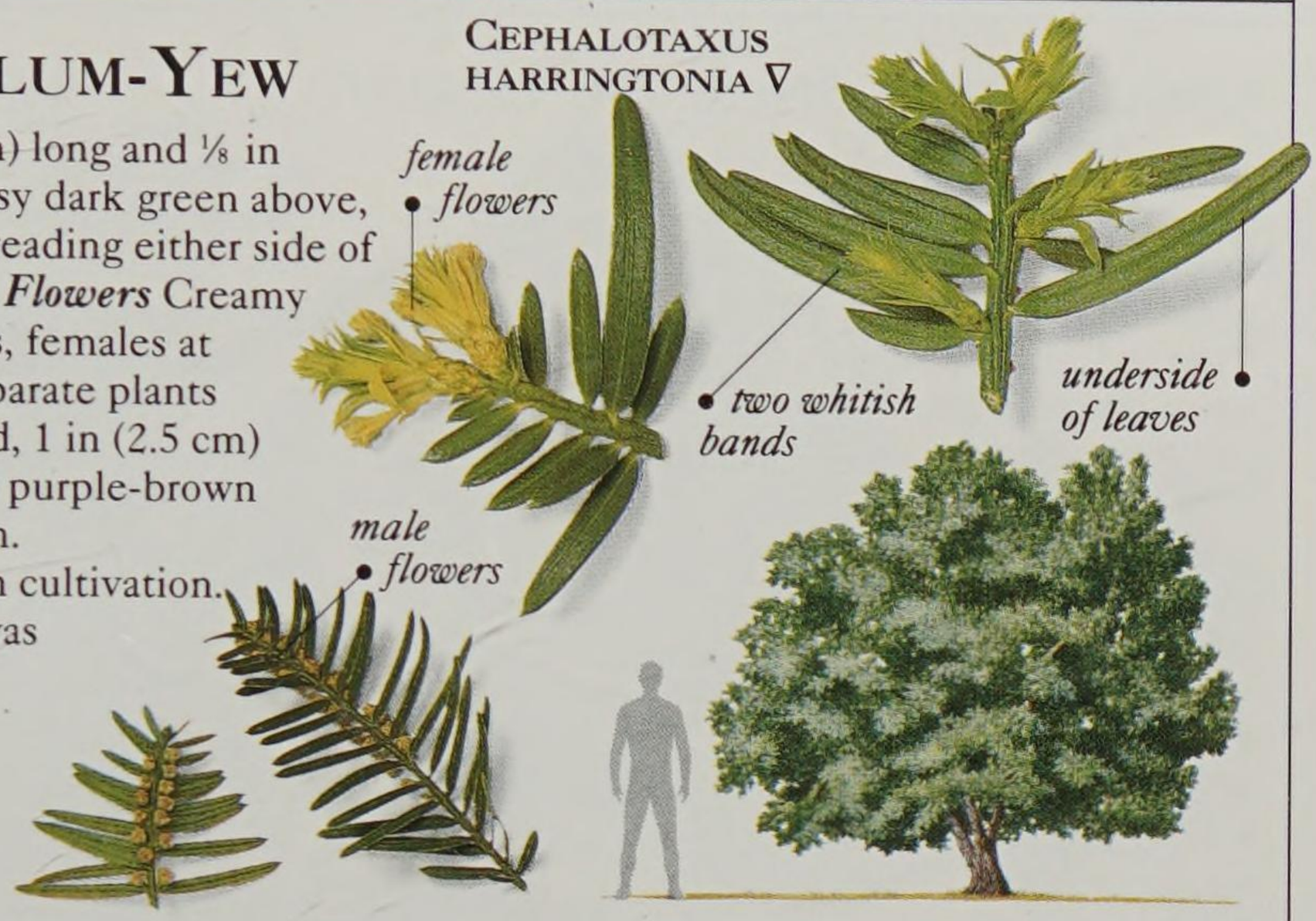
Family CEPHALOTAXACEAE	Species *Cephalotaxus harringtonia*	Author (Forbes) K. Koch

HARRINGTON PLUM-YEW

Leaves Linear, to 2 in (5 cm) long and ⅛ in (3 mm) across, pointed, glossy dark green above, with two bands beneath, spreading either side of shoot. ***Bark*** Brown, flaking. ***Flowers*** Creamy white, males in the leaf axils, females at the tips of the shoots, on separate plants in spring. ***Fruit*** An oval seed, 1 in (2.5 cm) long, blue-green ripening to purple-brown

- **NATIVE REGION** Japan.
- **HABITAT** Known only in cultivation.
- **REMARK** This species was originally described from a Japanese garden plant.

VAR. DRUPACEA ▷
This Japanese form has shorter leaves.



Height 20 ft (6 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

CUPRESSACEAE

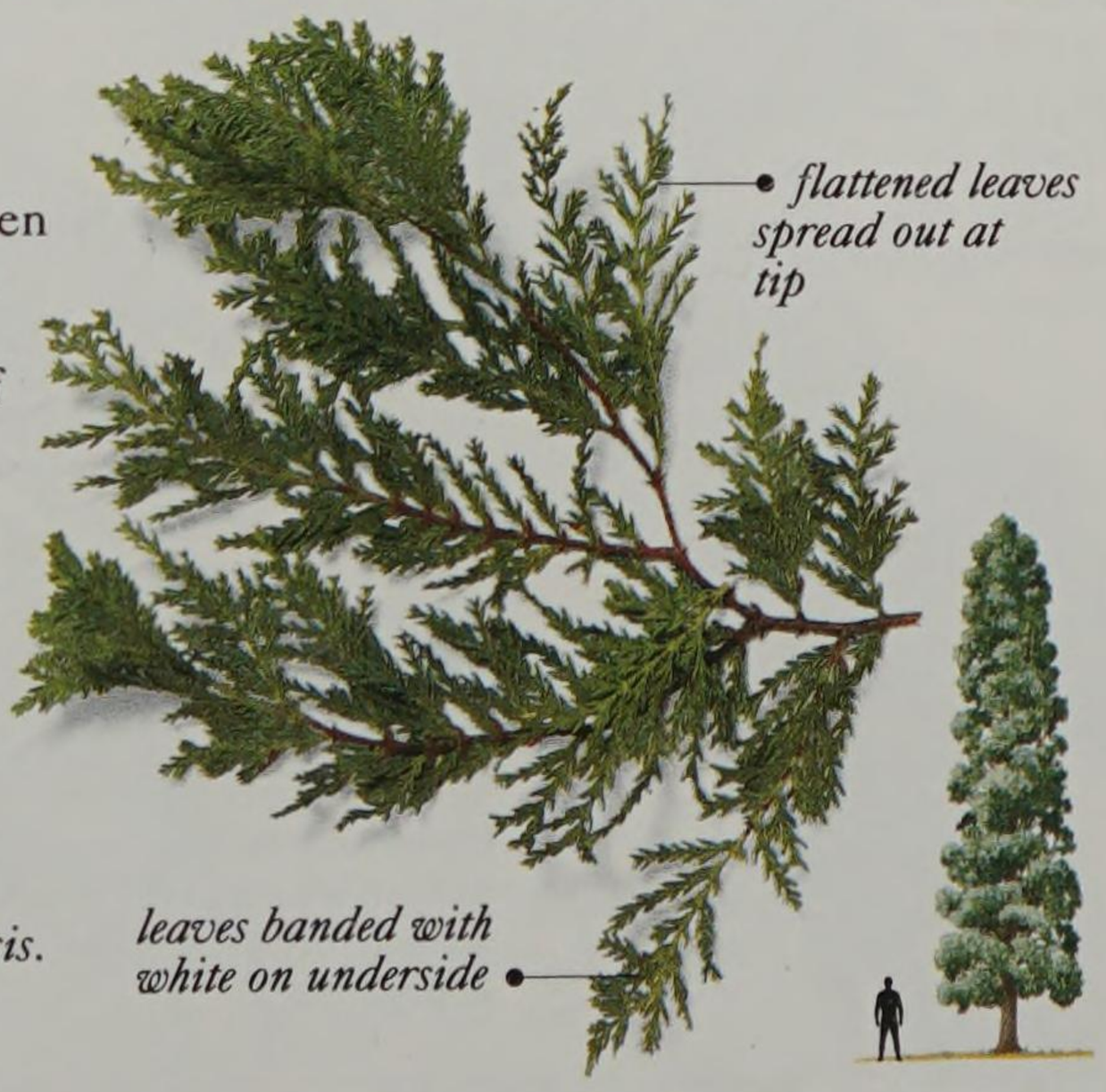
THIS FAMILY HAS ABOUT 20 genera, with more than 100 species of evergreen trees and shrubs, including the cypresses *(Cupressus*, see pp.41–43) and junipers *(Juniperus*, see pp.44–48), found worldwide. The small leaves are usually needlelike in young plants, but scalelike in mature trees; some juniper species bear both types. Male and female flowers are separate, on the same or different plants. The fruit is a cone, but is berrylike in junipers.

Family CUPRESSACEAE	Species *Austrocedrus chilensis*	Author (D. Don) Florin & Boutelje

CHILEAN CEDAR

Leaves Scalelike, to 3/16 in (5 mm) long, flattened, with a blunt point, glossy dark green sometimes marked with white above, with a conspicuous white band beneath, borne in flattened sprays; on upper and lower sides of shoot much smaller. ***Bark*** Gray-brown, scaly. ***Flowers*** Males and females both very small, males yellowish, females green, in small clusters at the tips of the shoots in early spring. ***Fruit*** An oblong cone, ⅜ in (1 cm) long, green ripening to brown, with four overlapping scales.

- **NATIVE REGION** Argentina, Chile.
- **HABITAT** Mountains.
- **REMARK** Also known as *Libocedrus chilensis*. It is closely related to the incense cedar *(Calocedrus decurrens*, see p.36).



Height 80 ft (25 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Calocedrus decurrens*	Author (Torrey) Florin

CALIFORNIA INCENSE CEDAR

Leaves Scalelike, to about ⅛ in (3 mm) long, in sets of two pairs together, with a triangular, sharp-pointed tip, glossy dark green, borne in flattened, aromatic sprays; upper and lower leaves largest. ***Bark*** Red-brown and scaly. ***Flowers*** Males and females both very small, males yellow, females green, in small clusters at the tips of the shoots in winter. ***Fruit*** An oblong, yellow-brown cone, 1 in (2.5 cm) long, with six overlapping scales.

• **NATIVE REGION**
W. North America.

• **HABITAT** Forests on mountain slopes.

• **REMARK** Also known as *Libocedrus decurrens*. In the wild, old plants eventually become more open in shape. It produces a useful, very aromatic wood.

shoots turn red-brown after one year

foliage in flattened sprays

tiny leaves pressed close to shoot

▽ **CALOCEDRUS DECURRENS**

△ **CALOCEDRUS DECURRENS**

longer leaves at base of shoot

scales spread out after cone ripens

shoots may be colored half green, half cream

'AUREOVARIEGATA' ▷
The foliage of this form is irregularly marked with yellow, which gives it an attractively variegated appearance.

foliage irregularly blotched creamy yellow

Height 130 ft (40 m)	Shape Narrowly columnar	Leaf persistence Evergreen	Leaf type

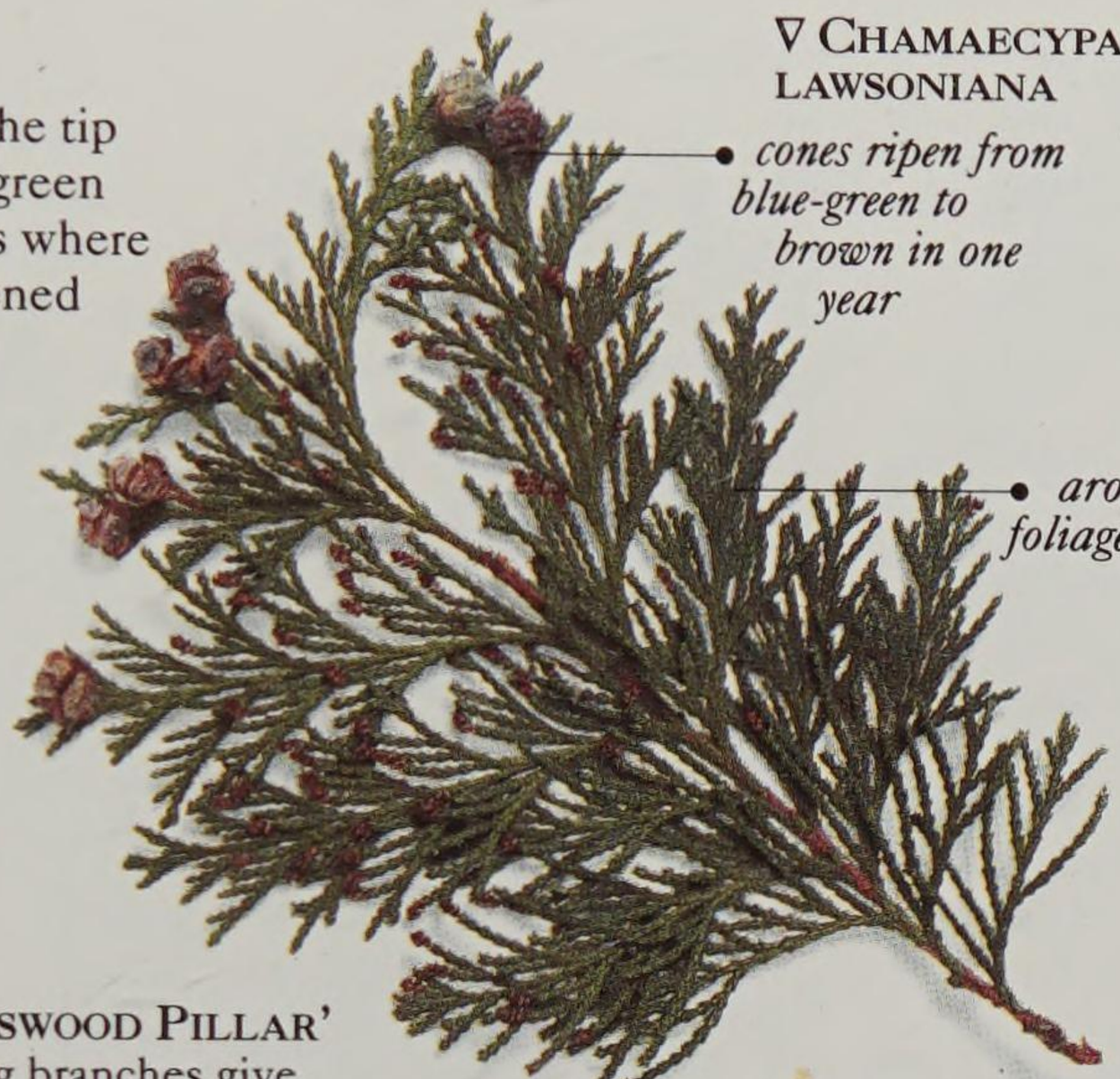
Family CUPRESSACEAE	Species *Chamaecyparis lawsoniana*	Author (Murray) Parlatore

LAWSON CYPRESS

Leaves Scalelike, very small, pointed, the tip often slightly free from the shoot, dark green above, paler with white X-shaped marks where the leaves meet beneath, borne in flattened sprays. ***Bark*** Purple-brown and flaking. ***Flowers*** Males red, females bluish, in clusters at the tips of the shoots in early spring. ***Fruit*** A rounded cone, 5/16 in (8 mm) across, with eight scales.

• **NATIVE REGION**
USA: N.W. California, S.W. Oregon.

• **HABITAT** Mountain slopes and canyons.



▽ CHAMAECYPARIS LAWSONIANA

◁ 'GRAYSWOOD PILLAR'
Ascending branches give this form a compact, columnar shape.

'HILLIERI' ▷
The golden yellow leaves of this very ornamental form are borne in large, flattened sprays.

△ 'ALBOSPICA'
This slow-growing selection forms a broadly conical tree.

Height 164 ft (50 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Chamaecyparis nootkatensis*	Author (D. Don) Spach

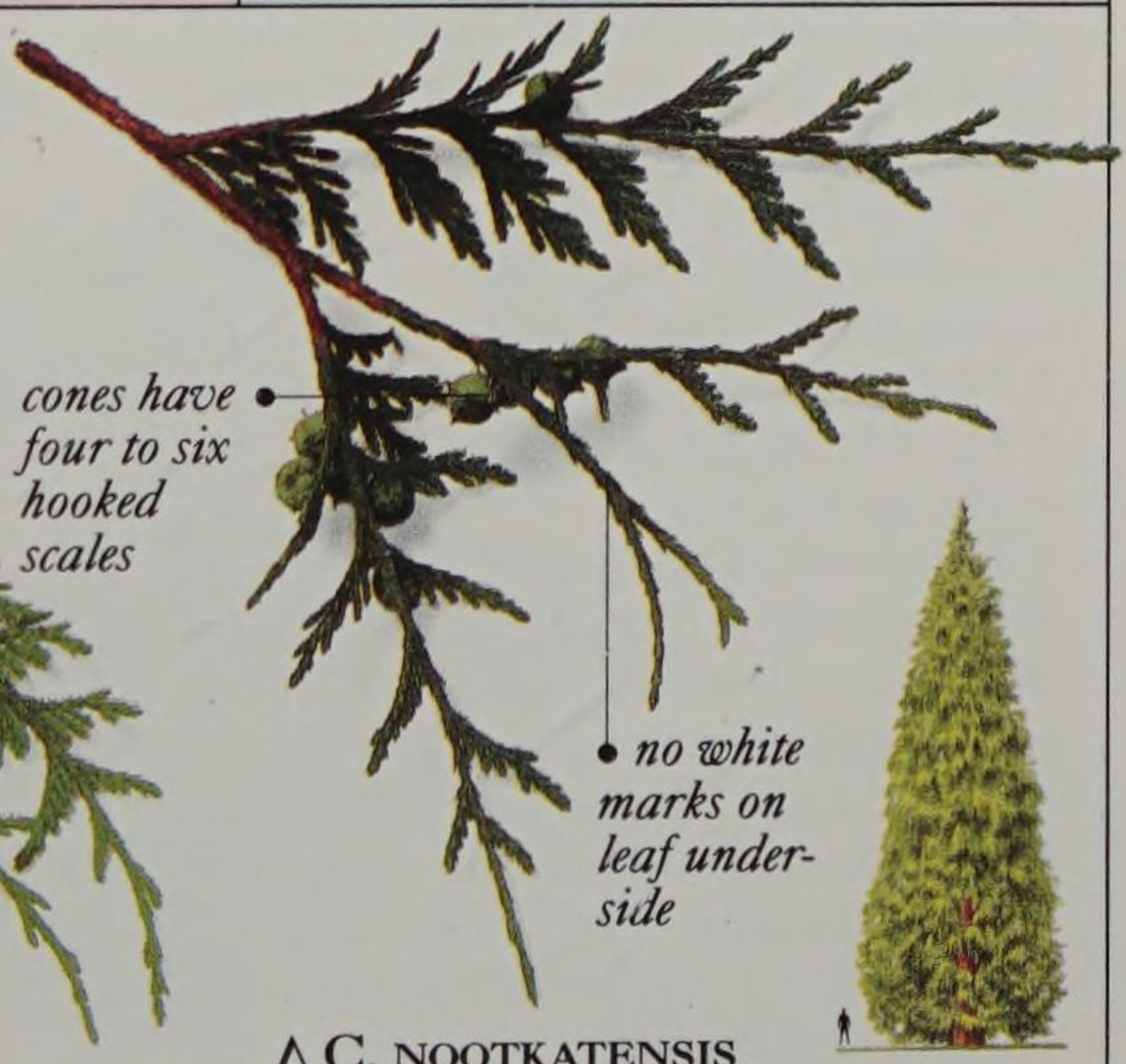
NOOTKA CYPRESS

Leaves Scalelike, very small, with free, pointed tips, keeled, dark green above, paler beneath, in flattened, aromatic sprays. ***Bark*** Gray-brown to orange-brown, stringy. ***Flowers*** Males yellow, females blue, in clusters at the shoot tips in early spring. ***Fruit*** A rounded cone, 3/8 in (1 cm) across, ripe in two years.

• **NATIVE REGION**
N.W. North America.

• **HABITAT** Coastal mountains.

'VARIEGATA' ▷
The foliage sprays of this form are irregularly blotched creamy white.



△ C. NOOTKATENSIS

Height 130 ft (40 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Chamaecyparis obtusa*	Author (Siebold & Zuccarini) Endlicher

HINOKI CYPRESS

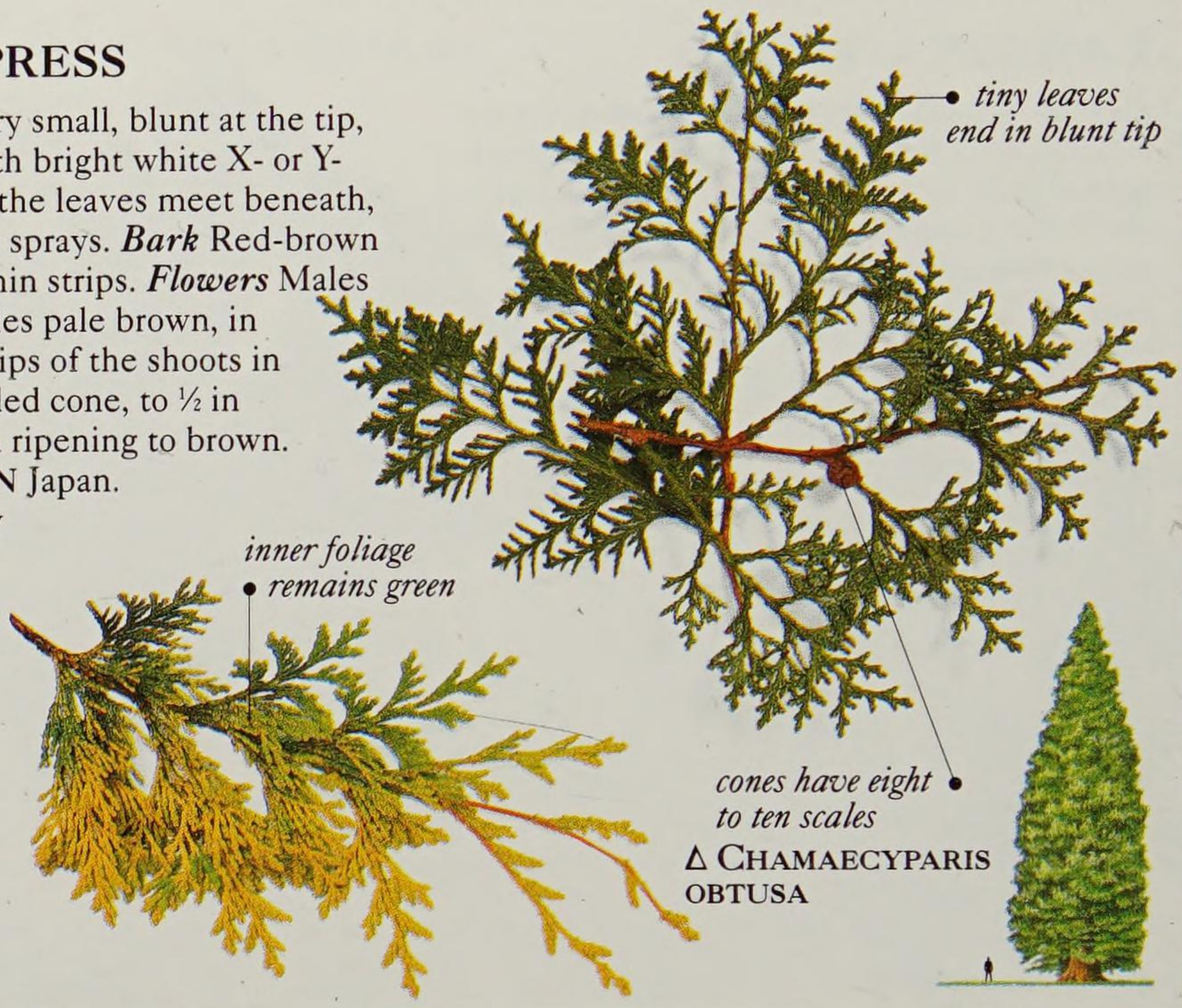
Leaves Scalelike, very small, blunt at the tip, dark green above, with bright white X- or Y-shaped marks where the leaves meet beneath, in flattened, aromatic sprays. ***Bark*** Red-brown and soft, peeling in thin strips. ***Flowers*** Males reddish yellow, females pale brown, in small clusters at the tips of the shoots in spring. ***Fruit*** A rounded cone, to ½ in (1.2 cm) across, green ripening to brown.

• **NATIVE REGION** Japan.

• **HABITAT** Usually mountain slopes.

• **REMARK** The cultivated forms include some of dwarf habit.

'CRIPPSII' ▷
The bright golden-yellow coloration of this ornamental form appears only on the outermost branches.



Δ **CHAMAECYPARIS OBTUSA**

Height 130 ft (40 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Chamaecyparis pisifera*	Author (Siebold & Zuccarini) Endlicher

SAWARA CYPRESS

Leaves Scalelike, very small, with free, pointed tips, glossy green above, with conspicuous white marks beneath, in flattened, aromatic sprays; leaves at side of shoot slightly larger than those above and below. ***Bark*** Red-brown, peeling in narrow strips. ***Flowers*** Males brownish, females pale brown, in small clusters at the tips of the shoots in spring. ***Fruit*** A rounded cone, 5/16 in (8 mm) across, green ripening to brown.

• **NATIVE REGION** Japan.

• **HABITAT** Streambanks in mountains.

• **REMARK** The specific element of the scientific name, *pisifera*, refers to the diminutive, pea-sized cones. Young seedlings have narrow leaves, to ¼ in (6 mm) long, a feature that is retained in some cultivated forms. The plant pictured in the traditional blue and white "willow pattern" design on pottery and porcelain represents this species.

Height 164 ft (50 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Chamaecyparis thyoides*	Author (L.) Britton, Sterns, Poggenberg

WHITE CYPRESS

Leaves Scalelike and very small, pointed at the tip, green to gray-green above, often with a tiny speck of resin, with bright white marks beneath, on slender shoots, in small, flattened, aromatic sprays; leaves at side of shoot slightly larger than those above. ***Bark*** Gray to brown, fibrous, peeling in strips. ***Flowers*** Males brownish, females green, in small clusters at the tips of the shoots in spring. ***Fruit*** A rounded cone, ¼ in (6 mm) across, glaucous ripening to brown, with six pointed scales.

• **NATIVE REGION**
E. United States.

• **HABITAT** Usually swamps, wet ground, and moist places.

• **REMARK** Also known as Atlantic white cedar, swamp cedar.

very small, pointed leaves

semi-ripe cone still whitish brown

typical coloration most striking on young foliage

very bloomy young cone

Δ CHAMAECYPARIS THYOIDES

∇ 'VARIEGATA'
As the cultivar name indicates, this plant is a variegated form of the species. Its foliage sprays are blotched more or less pale yellow.

occasional shoots have yellow foliage

some foliage sprays may be colored bright green

Δ 'GLAUCA'
This form is distinguished by its foliage, which is noticeably bluish white to blue-gray. The cones are also more bloomy.

Height 80 ft (25 m)	Shape Narrowly columnar	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species x *Cupressocyparis leylandii*	Author (Dallimore & Jackson) Dallimore

LEYLAND CYPRESS

Leaves Scalelike and very small, with pointed tips, dark green above, paler beneath, arranged at various angles to the shoot, borne in flattened sprays; leaves at side of and above shoot similar in size. ***Bark*** Red-brown, with shallow ridges. ***Flowers*** Males yellow, females green, in small clusters at the tips of the shoots in early spring. ***Fruit*** A rounded cone, to ¾ in (2 cm) across, blue-green ripening to glossy brown.

• **NATIVE REGION** Of garden origin.

• **REMARK** A hybrid between Nootka cypress *(Chamaecyparis nootkatensis*, see p.37) and Monterey cypress *(Cupressus macrocarpa*, see p.42). 'Haggerston Gray,' which has dull green foliage, is the form most commonly grown.

Δ 'HAGGERSTON GRAY'

Δ 'CASTLEWELLAN GOLD'
Young specimens of this form exhibit bright yellow foliage. On older, mature plants, the color deepens to reddish bronze-yellow.

Δ 'NAYLOR'S BLUE'
This form has foliage colored blue-gray to grayish green. It grows insto a very narrowly columnar tree.

'SILVER DUST' ▷
This form originated in the United States, at the National Arboretum, Washington D.C.

Height 100 ft (30 m)	Shape Narrowly columnar	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Cupressus cashmeriana*	Author Royle ex Carrière

KASHMIR CYPRESS

Leaves Scalelike and very small, but with free, spreading tips making the foliage rough to the touch, borne in glaucous, drooping, flattened sprays. ***Bark*** Red-brown, peeling in vertical strips. ***Flowers*** Males and females both inconspicuous, in separate clusters on the same plant in early to midwinter. ***Fruit*** A rounded cone, ½ in (1.2 cm) across, blue-green becoming greenish-yellow ripening to brown, the scales each with a hooked point.

• **NATIVE REGION** Not known; probably Himalayas.

• **HABITAT** Now known only in cultivation.

• **REMARK** A particularly elegant tree of small to medium height. The habit becomes more spreading as it ages.

Height 65 ft (20 m)	Shape Narrowly weeping	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Cupressus glabra*	Author Sudworth

SMOOTH ARIZONA CYPRESS

Leaves Scalelike and very small, with a pointed tip, blue-gray, with a minute fleck of white resin in the center on the underside, closely pressed to the stem, borne in irregular, aromatic sprays on reddish shoots. ***Bark*** Red-brown and red-purple, flaking in round patches. ***Flowers*** Males yellow and conspicuous, females green, in small clusters at the tips of the shoots, on the same plant in mid- to late winter. ***Fruit*** A rounded, gray-brown cone, to 1 in (2.5 cm) across, persisting on the branches for several years.

• **NATIVE REGION** Arizona.

• **HABITAT** Rocky mountain slopes.

• **REMARK** This species is commonly cultivated, and is usually found in the form 'Pyramidalis' with silvery-blue foliage and a dense habit. It is often found under the name of the similar, but much rarer, species *Cupressus arizonica*.

Height 65 ft (20 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Cupressus lusitanica*	Author Miller

CEDAR OF GOA OR MEXICAN CEDAR

Leaves Scalelike and very small, with free, pointed tips, gray-green, borne in irregular, slightly aromatic sprays. ***Bark*** Brown, peeling in vertical, fibrous strips. ***Flowers*** Males yellow-brown, females glaucous, in small clusters at the tips of the shoots in early spring. ***Fruit*** A rounded cone, ⅝ in (1.5 cm) across, glaucous-blue becoming glossy brown, each scale with a pointed projection, ripe in two years.

- **NATIVE REGION** C. America, Mexico.
- **HABITAT** Mountains.
- **REMARK** Also known as Mexican cypress. It was once thought to be native to Portugal.

Δ C. LUSITANICA

◁ 'GLAUCA PENDULA'
Weeping shoots, bearing blue-gray foliage, distinguish this form of the species.

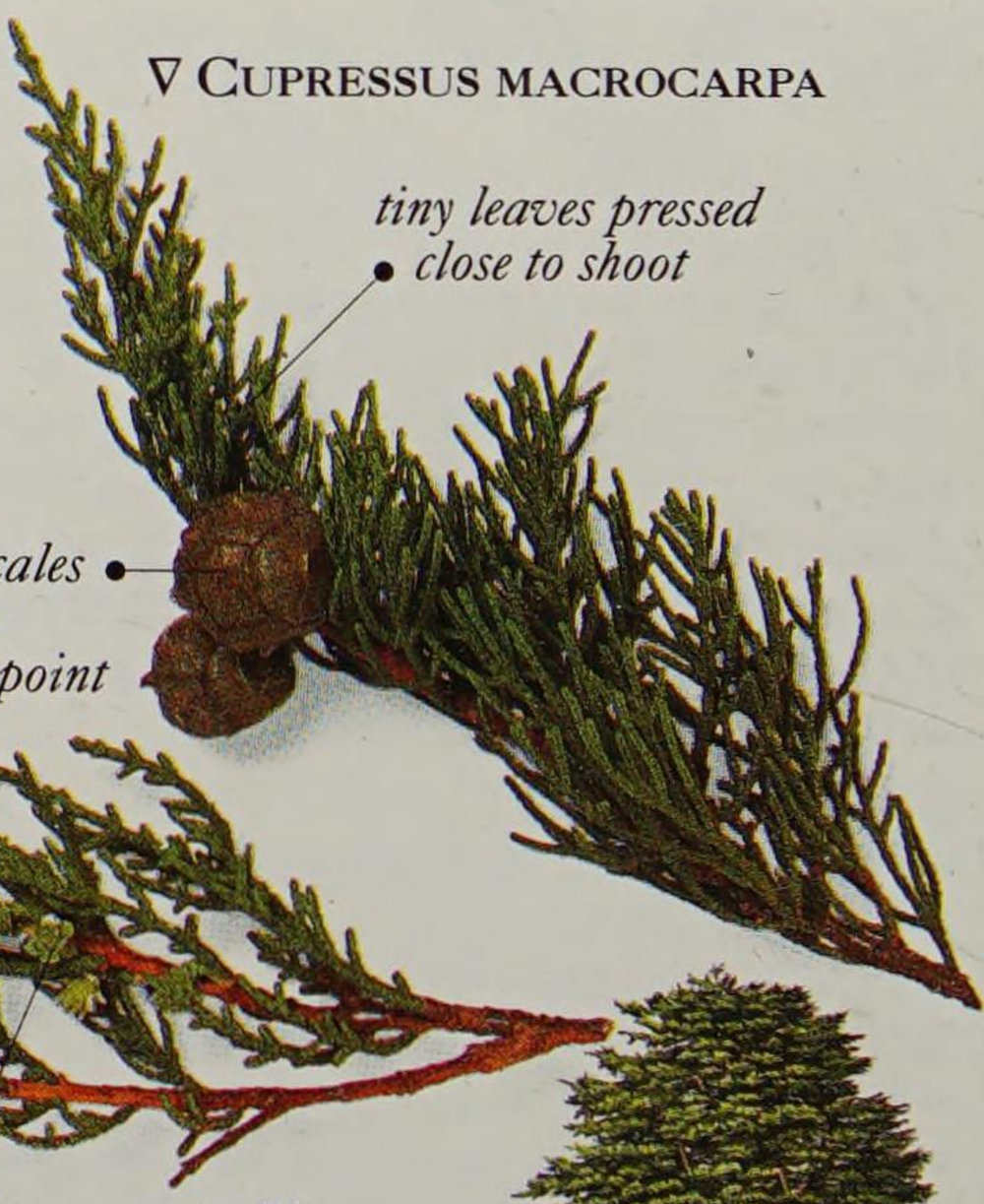
Height 100 ft (30 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Cupressus macrocarpa*	Author Hartweg ex Gordon

MONTEREY CYPRESS

Leaves Scalelike and very small, with pointed tips, closely pressed to the shoot, borne in irregular, aromatic sprays. ***Bark*** Red-brown, with shallow ridges. ***Flowers*** Males yellow, females green, in small clusters at the shoot tips in spring to early summer. ***Fruit*** A rounded cone, to 1½ in (4 cm) across, each scale with a short, blunt projection.

- **NATIVE REGION** California.
- **HABITAT** Evergreen forests near the coast.
- **REMARK** A rare tree, found around Monterey. The shape becomes spreading with age.



∇ CUPRESSUS MACROCARPA

'GOLDCREST' ▷
This striking form is one of several cultivars selected for their brilliant golden-yellow foliage.

Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Cupressus sempervirens*	Author Linnaeus

ITALIAN CYPRESS

Leaves Scalelike and very small, with blunt tips, very dark green, with no white marks beneath, only slightly aromatic or with no scent, borne in irregular sprays, closely pressed to the shoots. ***Bark*** Gray-brown, with shallow, spiral ridges. ***Flowers*** Males yellow-brown, females green, in small clusters at the tips of the shoots in spring. ***Fruit*** An egg-shaped to rounded cone, to 1½ in (4 cm) long, green ripening to brown, the scales overlapping, each scale with a small projection.

• **NATIVE REGION** S.W. Asia, E. Mediterranean.

• **HABITAT** Rocky places in mountains.

• **REMARK** The narrow form known as 'Stricta' is so commonly planted along the Mediterranean that it forms a characteristic feature of the landscape.

Δ CUPRESSUS SEMPERVIRENS

'SWANE'S GOLDEN' ▷
This form, which was raised in Australia, grows slowly, becoming a small, compact tree of very narrow habit. The yellow-tipped foliage sprays give the plant an overall golden appearance.

Height 164 ft (50 m)	Shape Narrowly columnar	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Fitzroya cupressoides*	Author (Molina) Johnston

PATAGONIAN CYPRESS

Leaves Oblong and thick, to ⅛ in (3 mm) long, bluntly pointed, in whorls of three, dark green, with two white bands on each side, on slender, pendulous shoots. ***Bark*** Red-brown, peeling in long, vertical strips. ***Flowers*** Males yellow, females yellow-green, borne in small clusters at the tips of the shoots in spring. ***Fruit*** A rounded, brown cone, 5/16 in (8 mm) across.

- **NATIVE REGION** Argentina, Chile.
- **HABITAT** Mountains.
- **REMARK** Very rare. Also known as alerce, Fitzroy cypress. Scientifically named after the captain in whose ship Charles Darwin voyaged to South America.

Height 164 ft (50 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Juniperus chinensis*	Author Linnaeus

CHINESE JUNIPER

Leaves Adults scalelike and very small, with blunt tips, in irregular, aromatic sprays, closely pressed to the shoot; juveniles needlelike, to 5/16 in (8 mm) long, sharp-pointed, opposite or in whorls of three, green, with two glaucous bands on the upper surface, at the base of the shoots. ***Bark*** Red-brown, peeling in vertical strips. ***Flowers*** Males yellow, females small and purple-green, in small clusters at the tips of the shoots, on separate plants in spring. ***Fruit*** A berrylike glaucous cone, to 5/16 in (8 mm) long.

- **NATIVE REGION** China, Japan.
- **HABITAT** Hills and mountains.
- **REMARK** Although both adult and juvenile foliage are usually present on individual plants, some trees may have either one type or the other. The species can be shrubby. It has many cultivated forms.

'AUREA' ▷
This form, known as Young's golden juniper, has golden yellow foliage.

Height 80 ft (25 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Juniperus communis*	Author Linnaeus

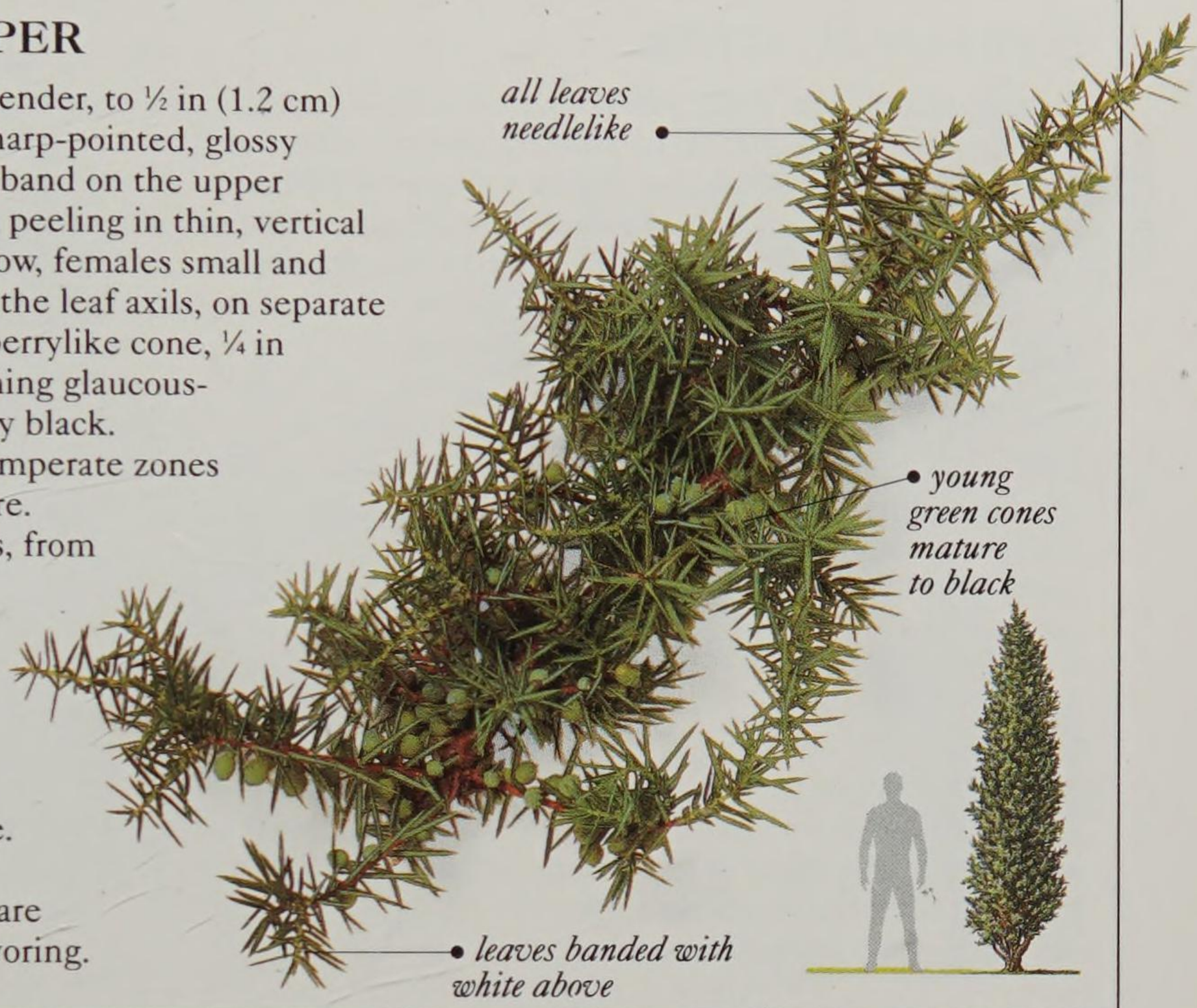
COMMON JUNIPER

Leaves Needlelike and slender, to ½ in (1.2 cm) long, in whorls of three, sharp-pointed, glossy green, with a broad white band on the upper surface. ***Bark*** Red-brown, peeling in thin, vertical strips. ***Flowers*** Males yellow, females small and green, in small clusters in the leaf axils, on separate plants in spring. ***Fruit*** A berrylike cone, ¼ in (6 mm) long, green becoming glaucous-bloomed ripening to glossy black.

• **NATIVE REGION** Temperate zones of the northern hemisphere.

• **HABITAT** Open places, from coastal rocks to high mountains.

• **REMARK** The species is variable: it can be a prostrate and creeping plant, a bushy shrub, or sometimes a tree. The berries give gin its characteristic taste. They are also used as a culinary flavoring.



Height 20 ft (6 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Juniperus deppeana*	Author Steudel

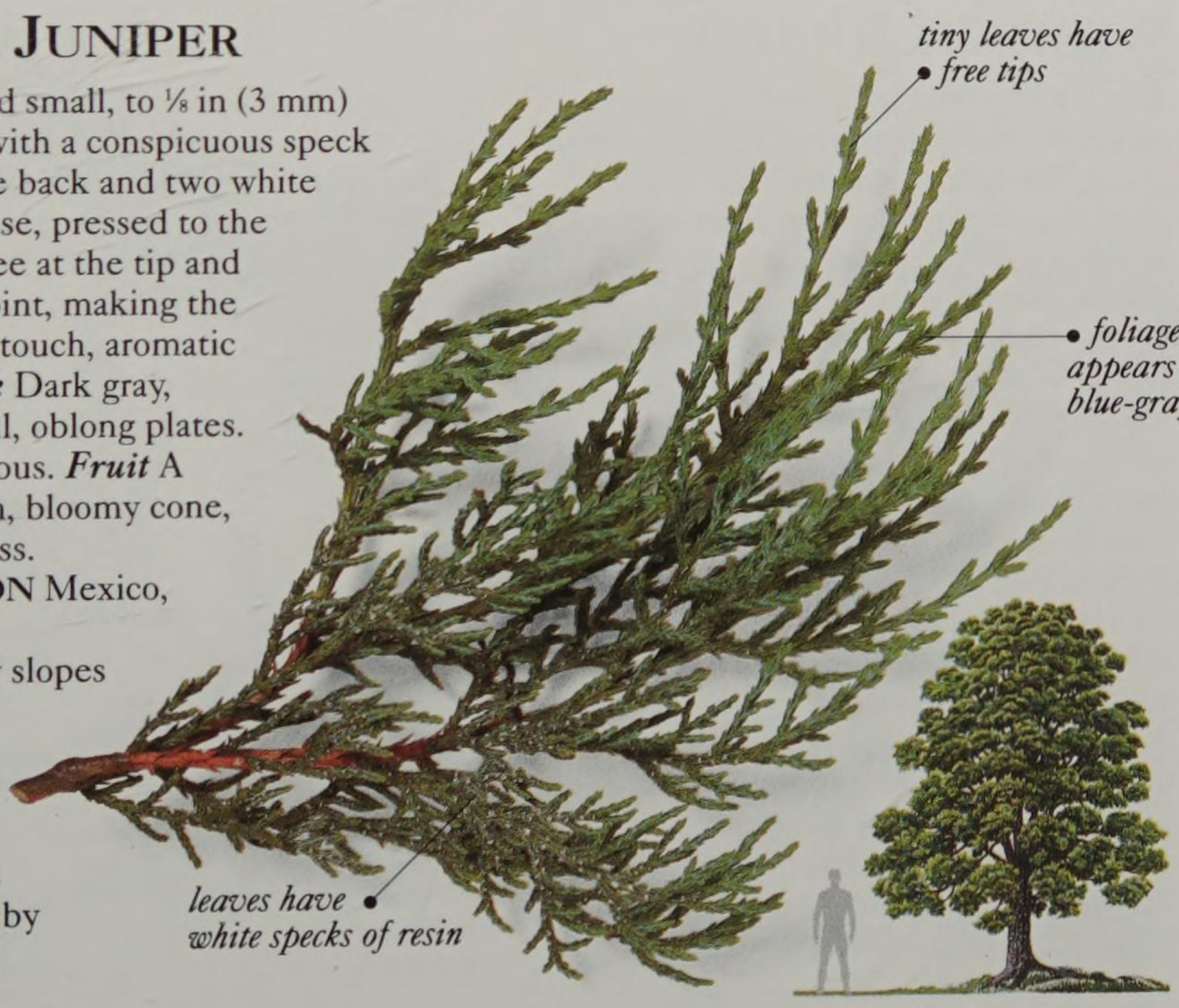
ALLIGATOR JUNIPER

Leaves Scalelike and small, to ⅛ in (3 mm) long, bright green, with a conspicuous speck of white resin on the back and two white bands toward the base, pressed to the shoot at the base, free at the tip and ending in a sharp point, making the foliage rough to the touch, aromatic when crushed. ***Bark*** Dark gray, deeply cut into small, oblong plates. ***Flowers*** Inconspicuous. ***Fruit*** A berrylike, red-brown, bloomy cone, to ⅝ in (1.5 cm) across.

• **NATIVE REGION** Mexico, S.W. United States.

• **HABITAT** Rocky slopes in high mountains.

• **REMARK** Also known as *Juniperus deppeana* var. *pachyphlaea*. It is easily distinguished by its characteristically checkered bark.



Height 50 ft (15 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Juniperus drupacea*	Author Labillardière

SYRIAN JUNIPER

Leaves Needlelike, rigid, and slender, to 1 in (2.5 cm) long, in whorls of three, sharp-pointed, marked with two broad, whitish bands above with a green midrib and margin, glossy green and ridged beneath, spreading from three-angled shoots. ***Bark*** Orange-brown, peeling in thin, vertical strips. ***Flowers*** Males yellow, females very small and green, borne in small clusters at the tips of short, leafy shoots, on separate plants in spring. ***Fruit*** A very large, berrylike, bloomy cone, 1 in (2.5 cm) long, blue-green at first becoming brown ripening to blackish purple, the triangular scales ending in a pointed tip.

• **NATIVE REGION**
S.W. Asia, Greece.

• **HABITAT** Mountain forests.

• **REMARK** The species is easily distinguished by its leaves, which are broader than those of any other juniper. The large cones are seen only rarely in cultivated plants.

Height 33 ft (10 m)	Shape Narrowly columnar	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Juniperus occidentalis*	Author W.J. Hooker

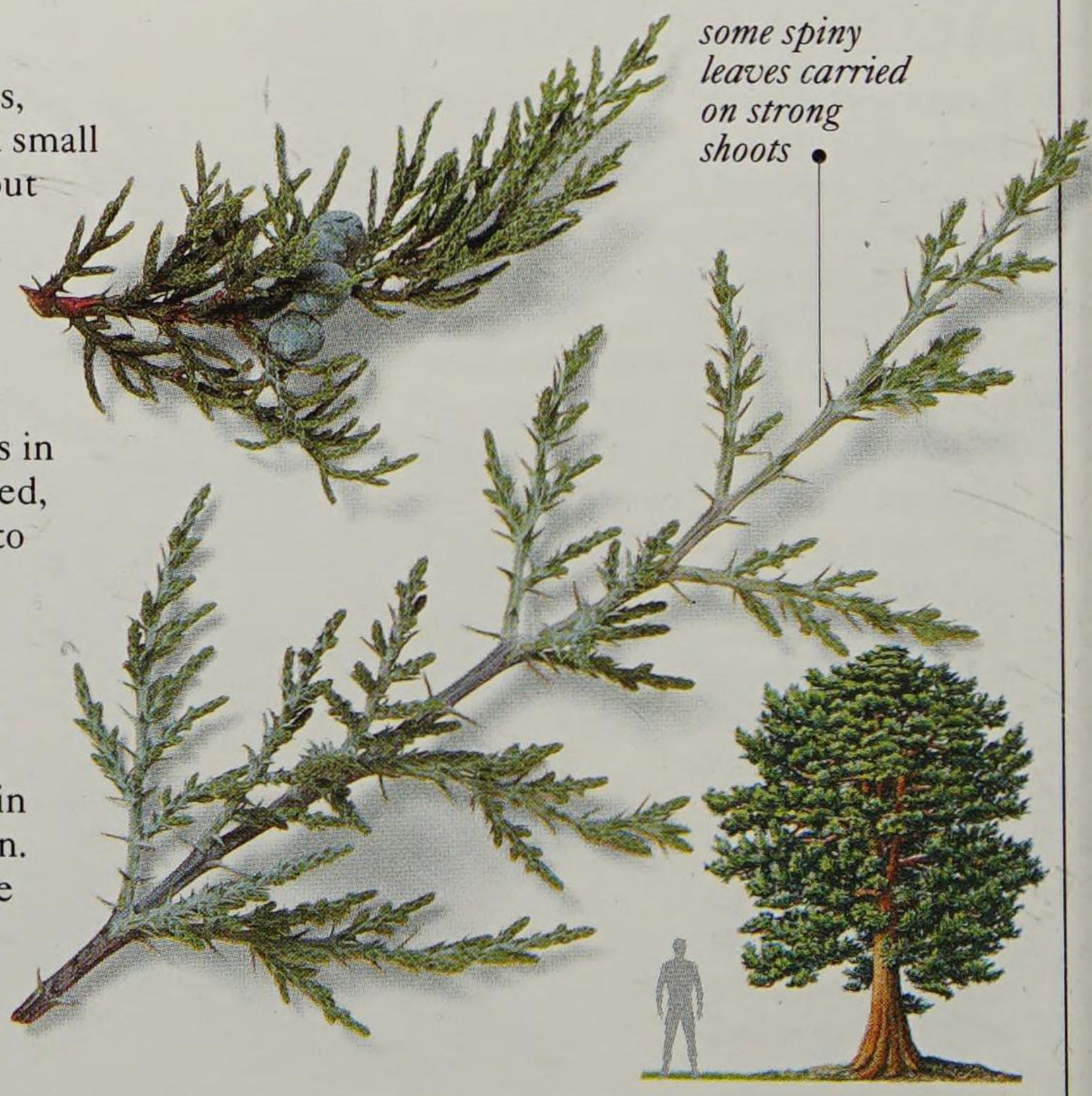
WESTERN JUNIPER

Leaves Scalelike and small, in threes, minutely toothed, gray-green, with a small gland beneath, closely pressed to stout shoots; on vigorous shoots sharp-pointed and free. ***Bark*** Red-brown, furrowed, and flaking. ***Flowers*** Males yellow, females green, in small clusters at the tips of the shoots, usually on separate plants in spring. ***Fruit*** A rounded to egg-shaped, berrylike, bloomy, blue-black cone, to ⅜ in (1 cm) long, ripe in two years.

• **NATIVE REGION**
W. United States.

• **HABITAT** Rocky slopes and dry soil in mountains.

• **REMARK** The toothed leaf margin can be seen only under magnification. In the Sierra Nevada mountain range in California, specimens of this species that are more than 2,000 years old can be found growing out of solid rock.



Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Juniperus oxycedrus*	Author Linnaeus

PRICKLY JUNIPER

Leaves Needlelike and slender, to 1 in (2.5 cm) long, spreading in whorls of three, sharp-pointed, green above, with two glaucous bands beneath. ***Bark*** Purple-brown, flaking in vertical strips. ***Flowers*** Males yellow, females green, borne in small clusters in the leaf axils, on separate plants in spring. ***Fruit*** A berrylike cone, ½ in (1.2 cm) across, bloomy ripening red to purple.

• **NATIVE REGION** S.W. Asia, S. Europe.

• **HABITAT** Dry hills and woods.

• **REMARK** Also known as cade. Oil of cade, traditionally used to treat skin ailments, is obtained from the wood. In the Balearic Islands, where the common juniper (*Juniperus communis*, see p.45) does not grow, prickly juniper berries are used instead as a substitute for flavoring gin.

Height 33 ft (10 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Juniperus recurva*	Author Buchanan-Hamilton ex D. Don

DROOPING JUNIPER

Leaves Needlelike and slender, to ¼ in (6 mm) long, in whorls of three, sharp-pointed, matte gray-green above, with two white bands beneath, dry and papery to touch, pointing forward along drooping shoots. ***Bark*** Red-brown, peeling in vertical strips. ***Flowers*** Males yellow, females green, borne in small clusters at the tips of the shoots, on the same plant in spring. ***Fruit*** A berrylike, glossy, blue-black cone, to 5/16 in (8 mm) long.

• **NATIVE REGION** S.W. China, Himalayas.

• **HABITAT** High mountains.

• **REMARK** Also known as Himalayan juniper. *Juniperus recurva* var. *coxii*, shown here, has slightly more spreading leaves, on drooping shoots.

JUNIPERUS RECURVA VAR. COXII

Height 50 ft (15 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Juniperus scopulorum*	Author Sargent

ROCKY MOUNTAIN JUNIPER

Leaves Scalelike, very small, green to gray-blue, closely pressed to the shoot. ***Bark*** Red-brown, peeling in thin strips. ***Flowers*** Males yellow, females green, in small clusters at the tips of the shoots, usually on the same plant in spring. ***Fruit*** A berrylike cone, ¼ in (6 mm) across, blue-black with a glaucous bloom, ripe in two years.

• **NATIVE REGION** W. North America.

• **HABITAT** Woods and rocky soil in mountains.

• **REMARK** Also known as Colorado red cedar, river juniper, Rocky Mountain red cedar. 'Skyrocket,' shown here, is the best-known cultivated garden form. This species, which resembles a cypress, gives its name to Cypress Island in Washington State, where it grows abundantly.

JUNIPERUS SCOPULORUM 'SKYROCKET'

Height 40 ft (12 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Juniperus virginiana*	Author Linnaeus

EASTERN RED CEDAR

Leaves Both juvenile and adult foliage usually present; adult leaves scalelike and very small, pointed, usually green to blue-green, closely pressed to the shoot; juvenile leaves needlelike, to ¼ in (6 mm) long, usually in pairs, sharp-pointed, gray-green above, glaucous beneath, at the tips of the shoots. ***Bark*** Red-brown, peeling in vertical strips. ***Flowers*** Males yellow, females green, in small clusters at the tips of the shoots, usually on separate plants in spring. ***Fruit*** A berrylike, glaucous, bloomy cone, ¼ in (6 mm) long, ripe in one year.

• **NATIVE REGION** E. North America.

• **HABITAT** Woods and rocky slopes.

• **REMARK** Also known as pencil cedar and red cedar. Widely distributed and planted. Its wood is used to make pencils.

JUNIPERUS VIRGINIANA

'GLAUCA' ▷
This form has glaucous-gray foliage.

Height 100 ft (30 m)	Shape Narrowly columnar	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Thuja koraiensis*	Author Nakai

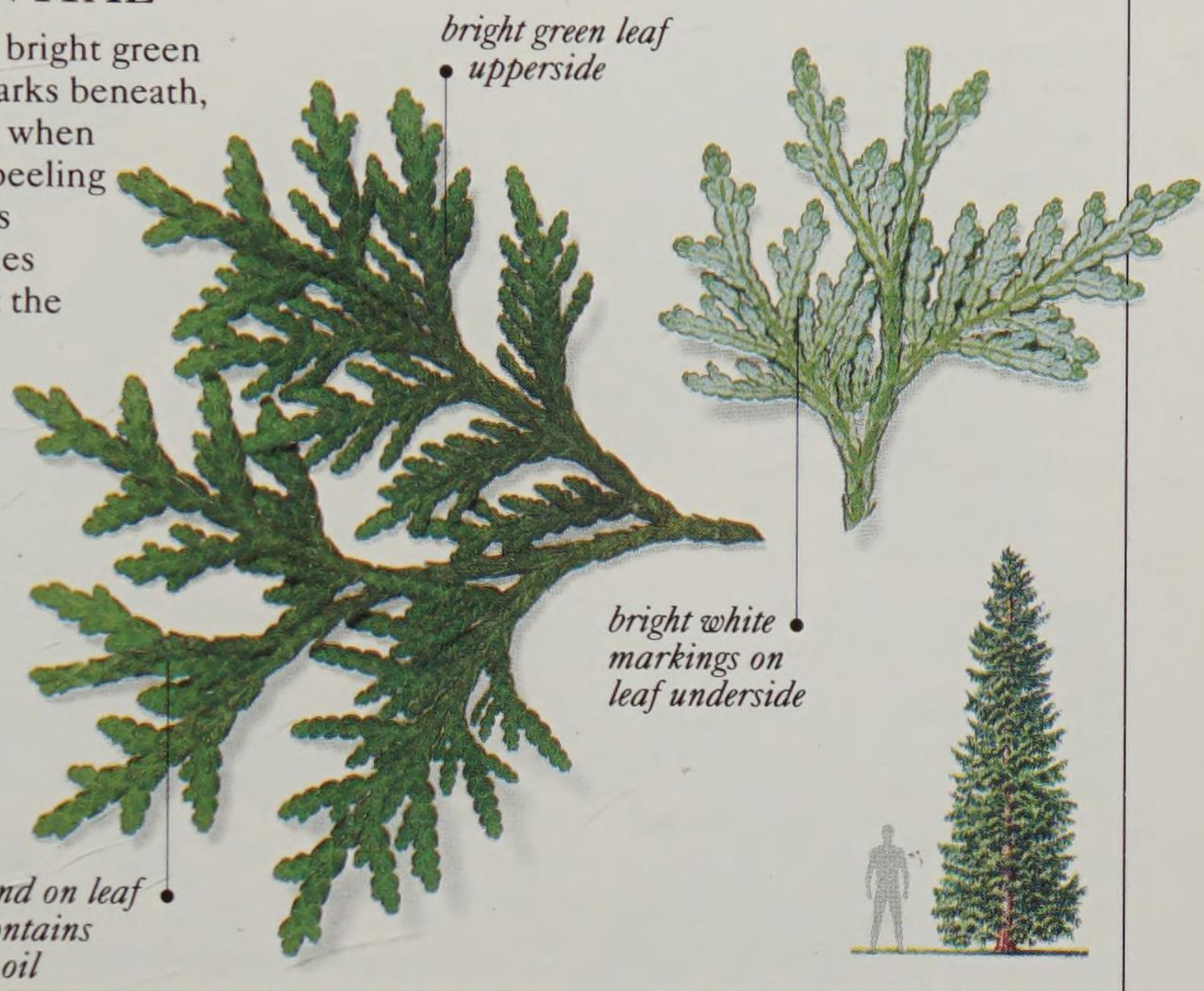
KOREAN ARBORVITAE

Leaves Scalelike and small, bright green above, with bright silvery marks beneath, in flattened sprays, aromatic when crushed. ***Bark*** Red-brown, peeling in thin scales. ***Flowers*** Males green, with black tips, females green, in separate clusters at the ends of the shoots, on the same plant in spring. ***Fruit*** An oblong, upright cone, ⅜ in (1 cm) long, yellow-green ripening to brown, with eight scales.

• **NATIVE REGION** N.E. China, Korea.

• **HABITAT** Mountain woods.

• **REMARK** This species can be either a small tree or a dense shrub.



Height 33 ft (10 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Thuja occidentalis*	Author Linnaeus

AMERICAN ARBORVITAE

Leaves Scalelike and very small, glossy yellowish green above, paler with no white marks beneath, borne in flattened, aromatic sprays, on flat shoots. ***Bark*** Orange-brown, peeling in vertical strips. ***Flowers*** Males red, females yellow-brown, in separate clusters at the ends of the shoots, on the same plant in spring. ***Fruit*** An oblong, upright cone, ⅜ in (1 cm) long, yellow-green ripening to brown, with eight to ten scales.

• **NATIVE REGION** E. North America.

• **HABITAT** Rocky mountain slopes, often on limestone, and swamps.

• **REMARK** Also known as white cedar. The species was one of the first North American trees to be grown in Europe. In cultivation, it has given rise to innumerable selections, including ornamental forms with colored foliage, and many of dwarf habit.

Height 65 ft (20 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

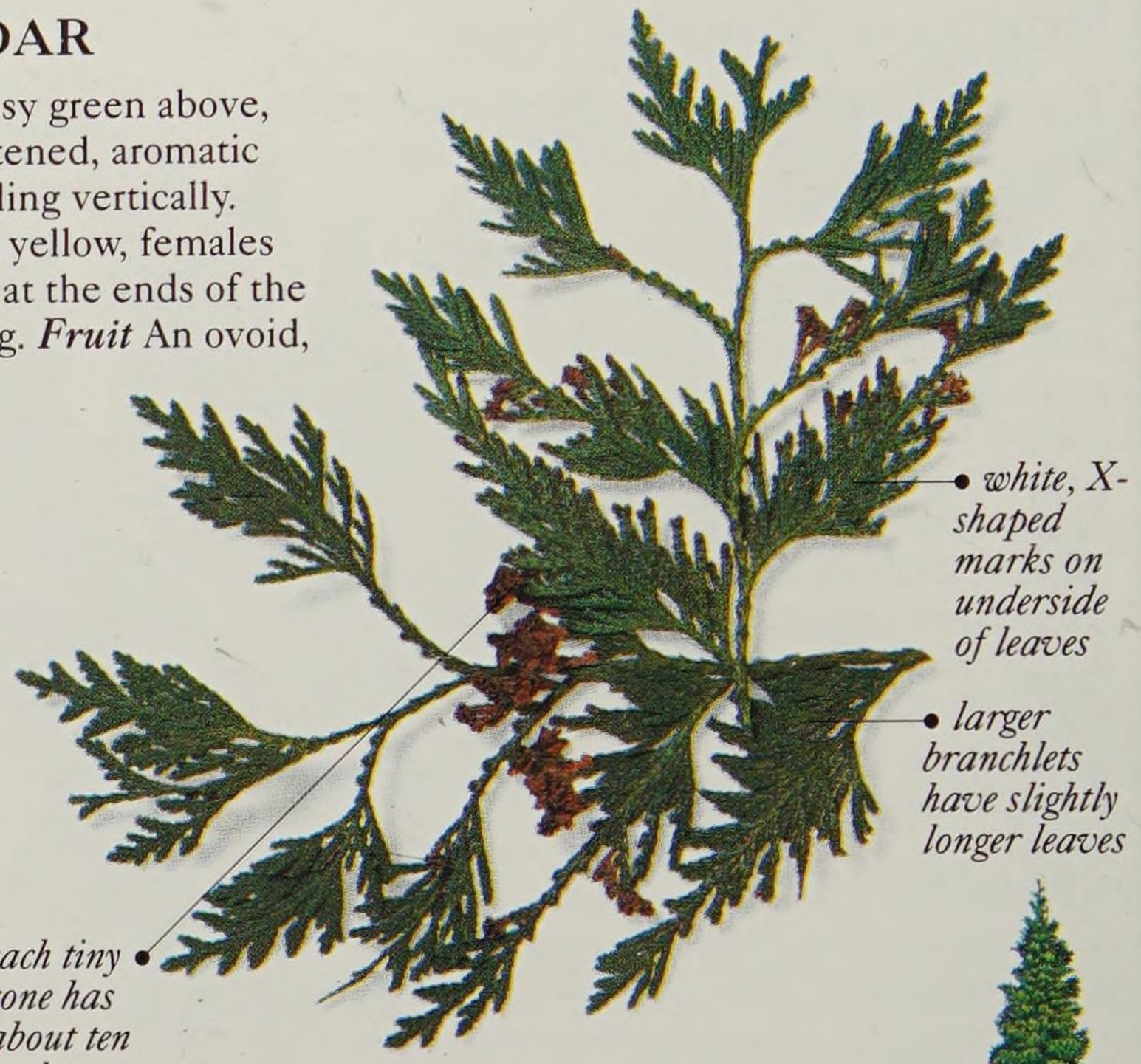
Family CUPRESSACEAE	Species *Thuja plicata*	Author D. Don

WESTERN RED CEDAR

Leaves Scalelike, very small, glossy green above, with white marks beneath, in flattened, aromatic sprays. ***Bark*** Purplish brown, peeling vertically. ***Flowers*** Males red-black opening yellow, females yellow-green, in separate clusters at the ends of the shoots, on the same plant in spring. ***Fruit*** An ovoid, upright cone, ½ in (1.2 cm) long, yellow-green ripening to brown.

• **NATIVE REGION** N.W. North America.

• **HABITAT** Mountains.



△ THUJA PLICATA

◁ 'ZEBRINA'
Alternate bands of green and yellow foliage give this form a variegated appearance.

Height 164 ft (50 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Thuja standishii*	Author (Gordon) Carrière

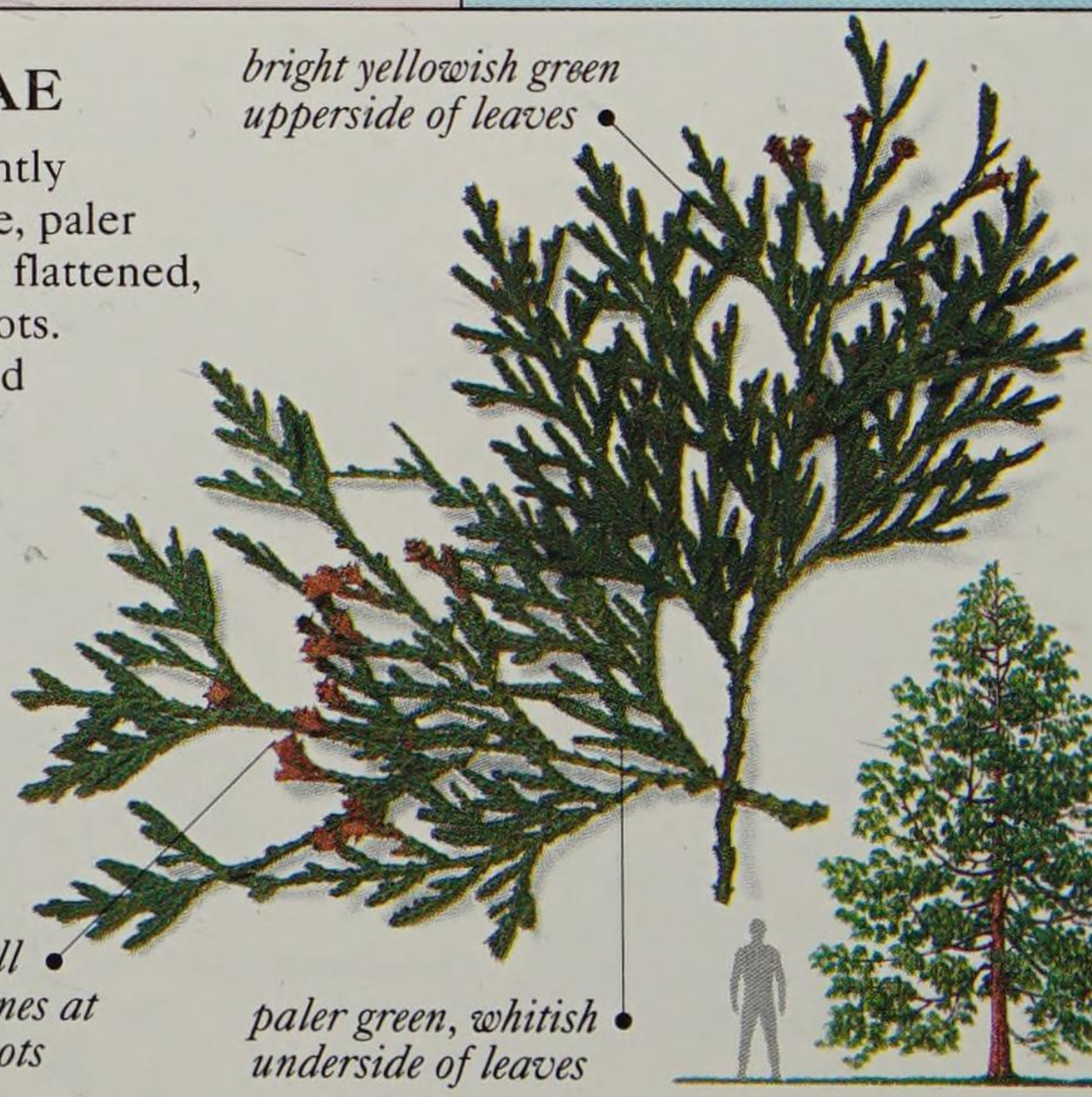
JAPANESE ARBORVITAE

Leaves Scalelike and very small, bluntly pointed at the tip, yellow-green above, paler with small, whitish marks beneath, in flattened, drooping, aromatic sprays, on flat shoots. ***Bark*** Red-brown, peeling in strips and plates. ***Flowers*** Males blackish red opening yellow, females greenish, in separate clusters at the tips of the shoots, on the same plant in spring. ***Fruit*** An oblong, upright cone, ⅜ in (1 cm) long, green ripening to red-brown, with about ten scales.

• **NATIVE REGION** Japan.

• **HABITAT** Rocky mountain ridges and moors.

• **REMARK** When crushed, the foliage has a particularly sweet scent.



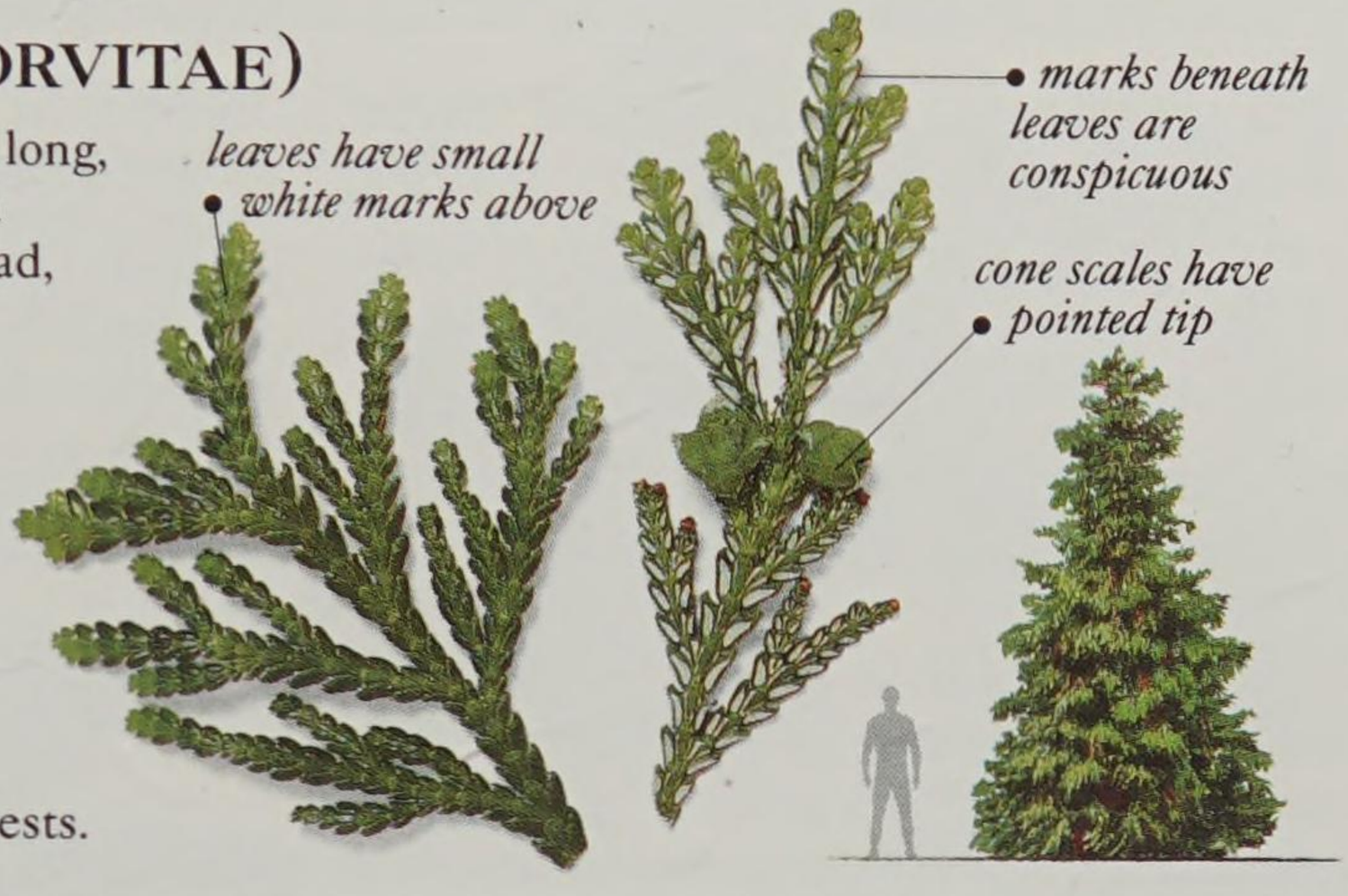
Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family CUPRESSACEAE	Species *Thujopsis dolabrata*	Author (Linnaeus f.) Siebold & Zuccarini

HIBA (FALSE ARBORVITAE)

Leaves Scalelike, to ¼ in (6 mm) long, glossy dark green to yellow-green above, in flattened sprays, on broad, flat shoots. ***Bark*** Purple-brown, flaking in thin, vertical strips. ***Flowers*** Males blackish green, females blue-gray, in separate clusters at the ends of the shoots, on the same plant in spring. ***Fruit*** A brown, bloomy cone, ½ in (1.2 cm) long.

- **NATIVE REGION** Japan.
- **HABITAT** Moist mountain forests.



Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

GINKGOACEAE

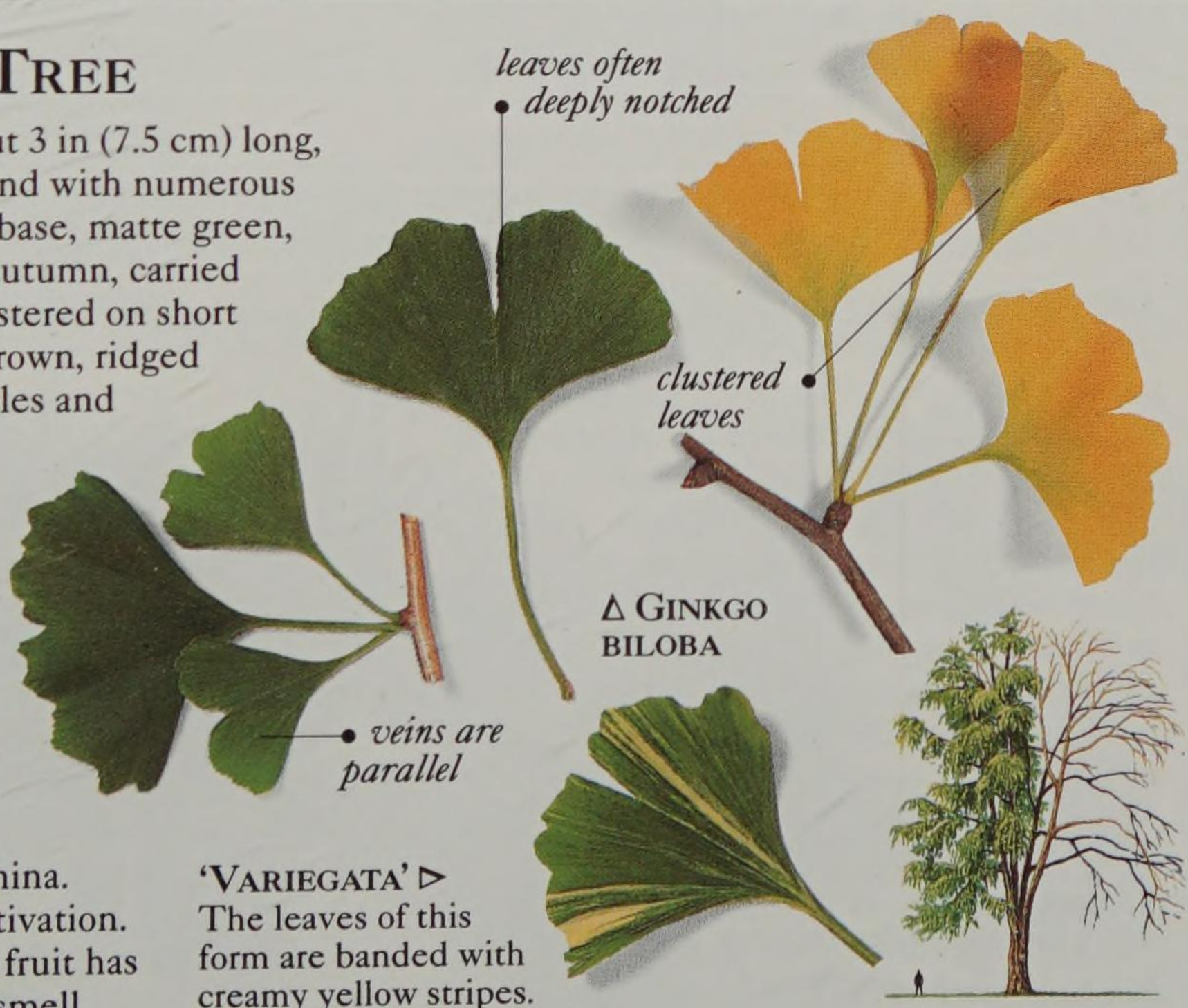
ALTHOUGH THIS FAMILY HAS only a single member with no closely related species, fossil records show that similar plants were at one time – between approximately 150 and 200 million years ago – widely distributed in all parts of the world. The species, usually classed as a conifer, is in fact the sole survivor of a group of plants more primitive than the true conifers.

Family GINKGOACEAE	Species *Ginkgo biloba*	Author Linnaeus

MAIDENHAIR TREE

Leaves Fan-shaped, about 3 in (7.5 cm) long, often variously notched and with numerous veins diverging from the base, matte green, turning bright yellow in autumn, carried singly on long shoots, clustered on short side shoots. ***Bark*** Gray-brown, ridged and fissured. ***Flowers*** Males and females both small and yellow-green, males in catkinlike clusters, females singly or in pairs on a short stalk, on separate plants in spring. ***Fruit*** A fleshy, plumlike seed, yellow-green ripening to orange-brown, the kernel edible.

- **NATIVE REGION** China.
- **HABITAT** Only in cultivation.
- **REMARK** The rotting fruit has a particularly unpleasant smell.



△ GINKGO BILOBA

'VARIEGATA' ▷
The leaves of this form are banded with creamy yellow stripes.

Height 130 ft (40 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

PINACEAE

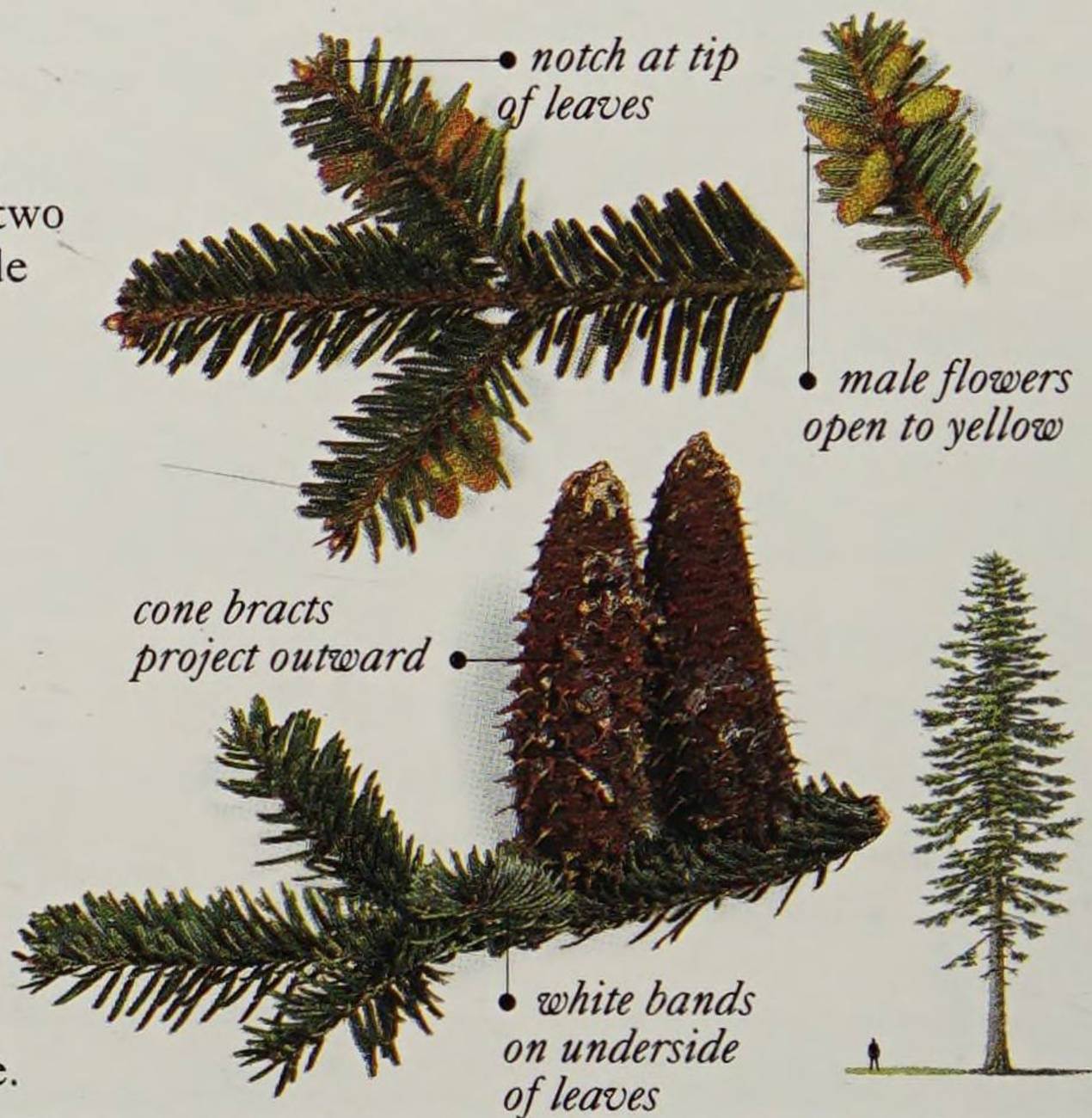
THIS FAMILY INCLUDES THE silver firs *(Abies*, see pp.52–57), larches *(Larix*, see pp.60–61), and pines *(Pinus*, see pp.66–75). About 200 species of trees and shrubs, in ten genera, grow mainly in northern temperate regions. The species of larch and *Pseudolarix* (see p.76) are deciduous. The flowers are borne separately on the same plant; females develop into a woody cone.

Family PINACEAE	Species *Abies alba*	Author Miller

SILVER FIR

Leaves Linear, to 1¼ in (3 cm) long, with a notched tip, glossy dark green above, with two whitish bands beneath, spreading either side of the shoot, shorter and pointing forward above. ***Bark*** Gray and smooth, cracking into small plates with age. ***Flowers*** Males yellow, beneath the shoot, females green, upright, borne in separate clusters on the same plant in spring. ***Fruit*** A cylindrical, upright cone, to 6 in (15 cm) long, green at first ripening to brown, with protruding, down-turned bracts.

- **NATIVE REGION** Europe.
- **HABITAT** Mountain forests.
- **REMARK** Also known as European silver fir. Cones usually grow only high on the tree. This species is widely used as a Christmas tree in many parts of Europe.



Height 130 ft (40 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Abies bracteata*	Author (D. Don) Nuttall

BRISTLECONE FIR

Leaves Needlelike and rigid, to 2 in (5 cm) long, ending in a very sharp point, glossy dark green above, with two white bands beneath, spreading either side of the shoot. ***Bark*** Dark gray and smooth. ***Flowers*** Males yellowish, beneath the shoot, females green, upright, borne in separate clusters on the same plant in spring. ***Fruit*** An egg-shaped, upright cone, to 4 in (10 cm) long, green ripening to brown, with conspicuously long, bristly bracts.

- **NATIVE REGION** California.
- **HABITAT** Evergreen forests on mountain slopes.
- **REMARK** Also known as Santa Lucia fir. It is the rarest native North American fir.

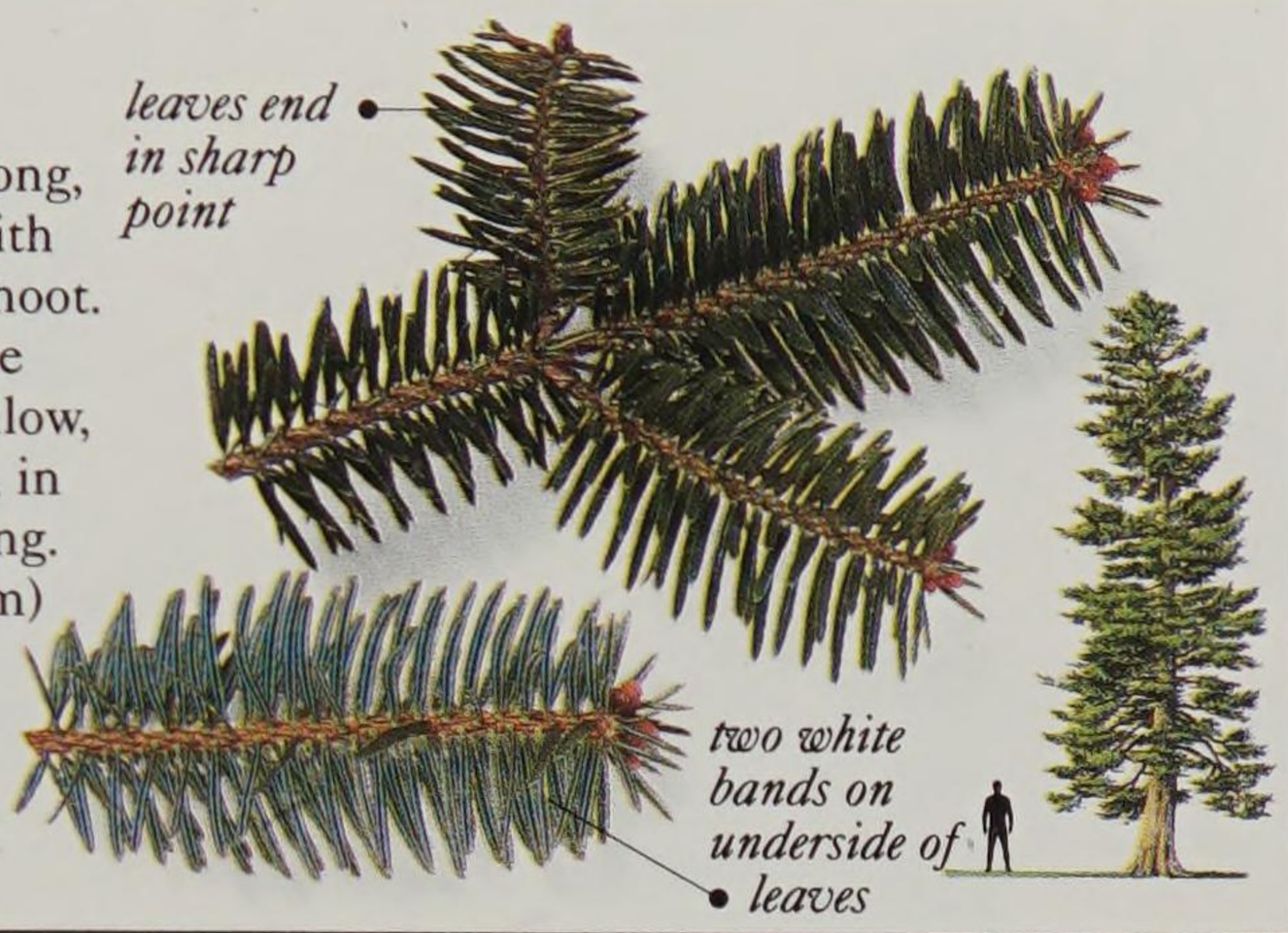
Height 115 ft (35 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Abies cephalonica*	Author Loudon

GREEK FIR

Leaves Linear and rigid, to 1¼ in (3 cm) long, sharp-pointed, glossy dark green above, with two white bands beneath, all around the shoot. ***Bark*** Dark gray, cracking into small, square plates. ***Flowers*** Males reddish opening yellow, beneath the shoot, females green, upright, in separate clusters on the same plant in spring. ***Fruit*** A brown, upright cone, to 6 in (15 cm) long, cylindrical narrowing at either end, with protruding, downturned bracts.

- **NATIVE REGION** S.E. Europe.
- **HABITAT** Mountains.



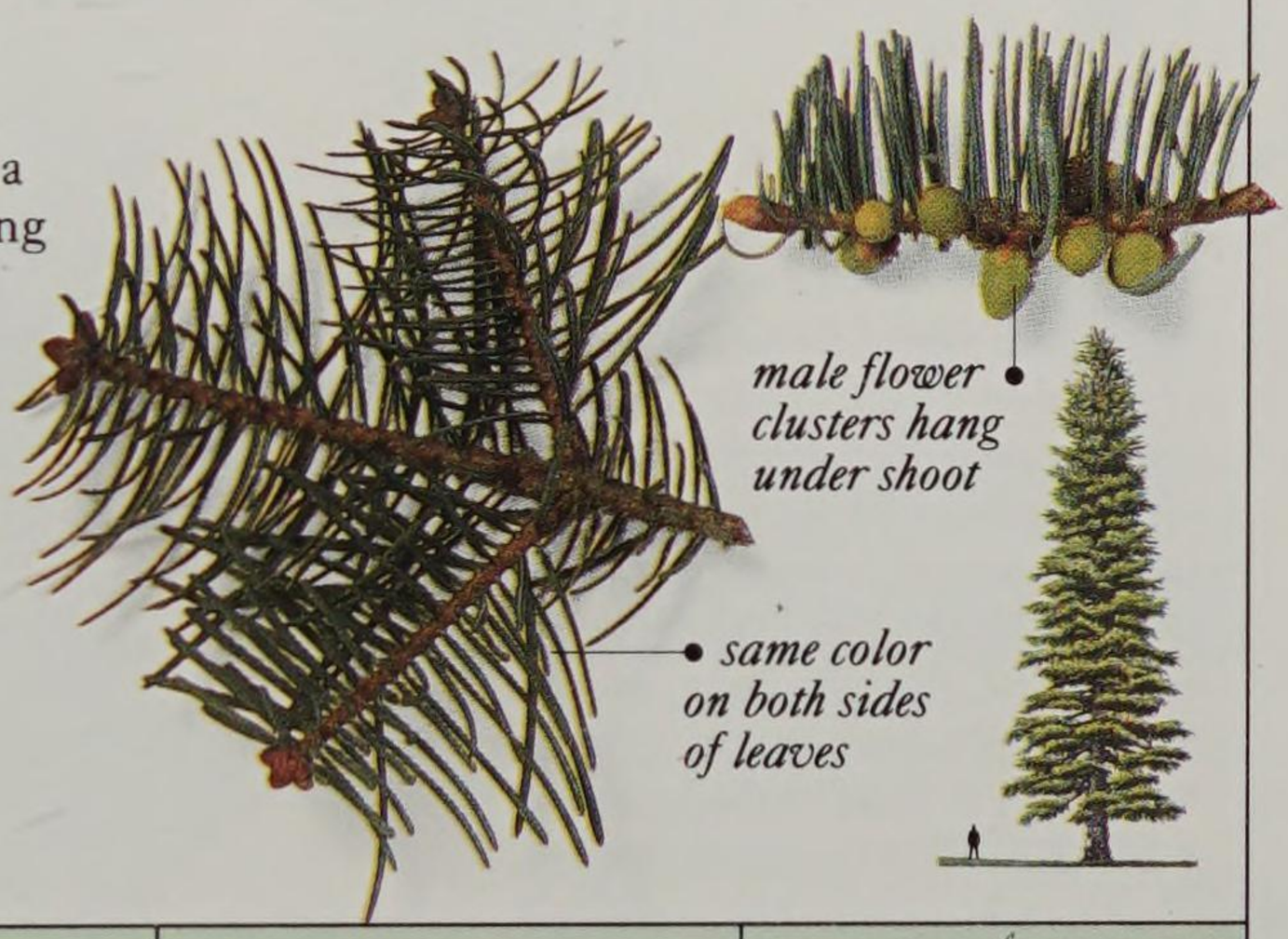
Height 100 ft (30 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Abies concolor*	Author (Gordon) Lindley

WHITE FIR

Leaves Linear, to 2½ in (6 cm) long, with a blunt tip, blue-gray or gray-green, spreading beneath the shoot, upswept above. ***Bark*** Gray, smooth, becoming scaly with age. ***Flowers*** Males yellow, beneath the shoot, females greenish-yellow, upright, in separate clusters on the same plant in spring. ***Fruit*** A cylindrical, upright cone, to 4 in (10 cm) long, green to purple ripening to brown.

- **NATIVE REGION** W. United States.
- **HABITAT** Mountain slopes.
- **REMARK** Also known as Colorado fir.



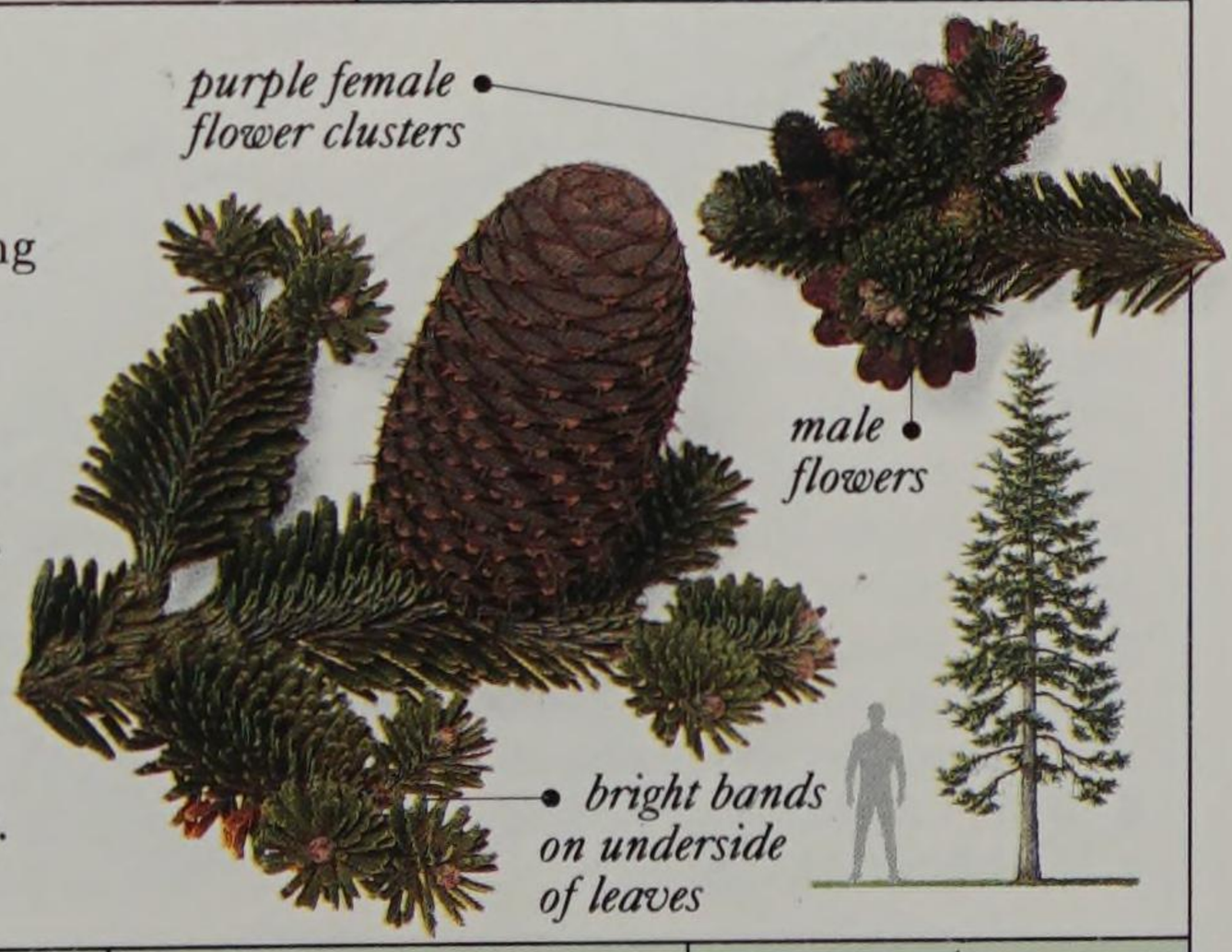
Height 130 ft (40 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Abies forrestii*	Author Rogers

ABIES FORRESTII

Leaves Linear, to 1½ in (4 cm) long, with a notched tip, very dark green above, spreading beneath the shoot, densely arranged above. ***Bark*** Gray, smooth. ***Flowers*** Males purple opening yellow, beneath the shoot, females purple, upright, in separate clusters on the same plant in spring. ***Fruit*** An upright cone, to 4 in (10 cm) long, broadly cylindrical with a flat top, deep purple ripening to purple-brown, with small, protruding, downturned bracts.

- **NATIVE REGION** W. China, S.E. Tibet.
- **HABITAT** High mountains.



Height 65 ft (20 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Abies grandis*	Author (Douglas) Lindley

GIANT FIR

Leaves Linear and slender, to 2 in (5 cm) long, with a notched tip, bright green above, with two white bands beneath, spreading either side of the shoot. ***Bark*** Gray-brown, smooth, cracking with age. ***Flowers*** Males reddish opening yellow, females green, upright, in separate clusters on the same plant in spring. ***Fruit*** A cylindrical, upright cone, to 4 in (10 cm) long, green ripening to brown.

• **NATIVE REGION** W. North America.

• **HABITAT** Evergreen forests on low mountain slopes.

Height 164 ft (50 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

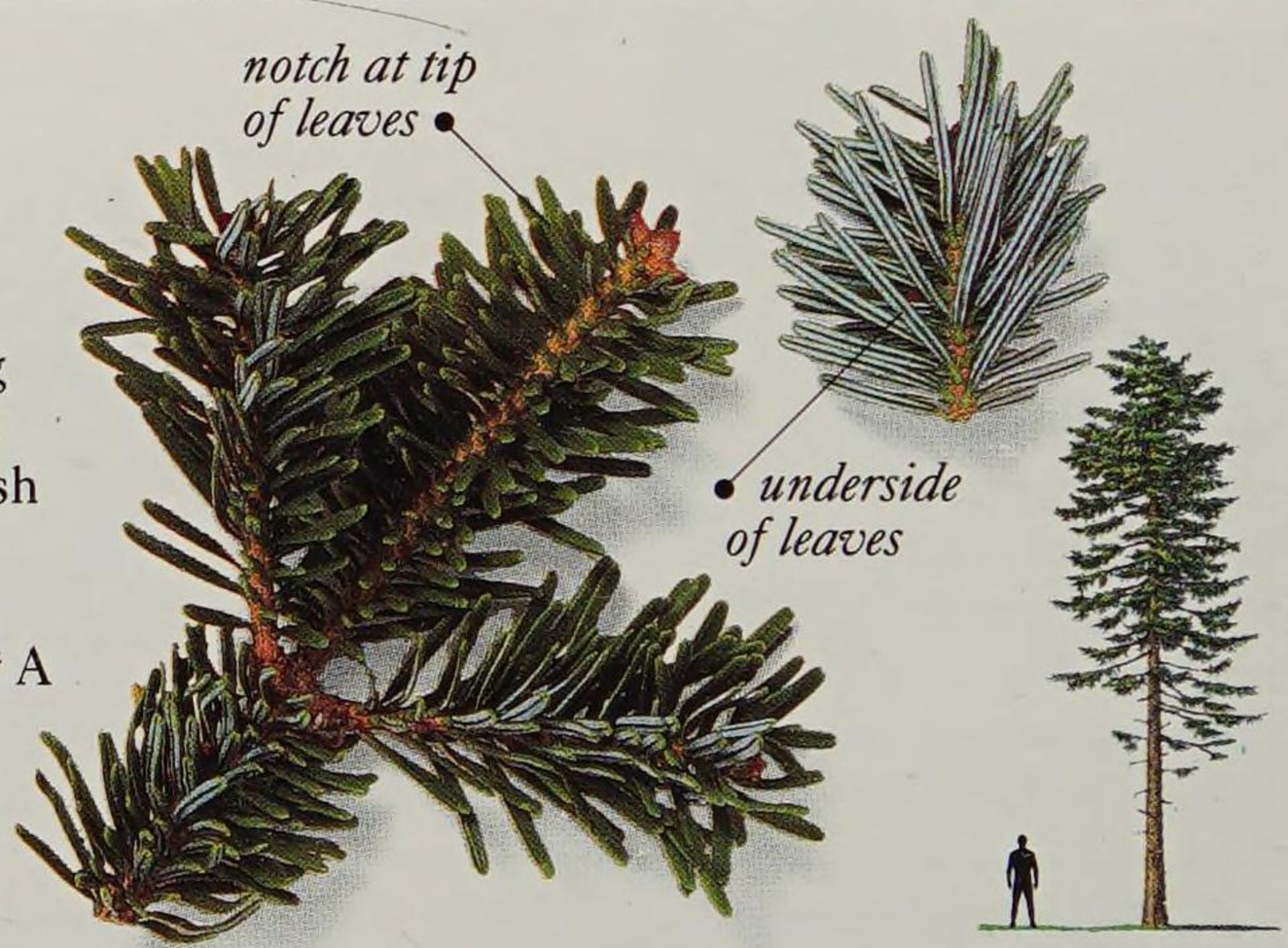
Family PINACEAE	Species *Abies homolepis*	Author Siebold & Zuccarini

NIKKO FIR

Leaves Linear, to 1¼ in (3 cm) long, with a notched tip, glossy dark green and bloomy at least when young above, with two broad white bands beneath, spreading either side of the shoot. ***Bark*** Gray tinged pink, scaly with age. ***Flowers*** Males reddish opening yellow-green, beneath the shoot, females purplish red, upright, in separate clusters on the same plant in spring. ***Fruit*** A cylindrical, upright cone, to 4 in (10 cm) long, purple-blue ripening to brown.

• **NATIVE REGION** Japan.

• **HABITAT** Mountain forests.



Height 100 ft (30 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

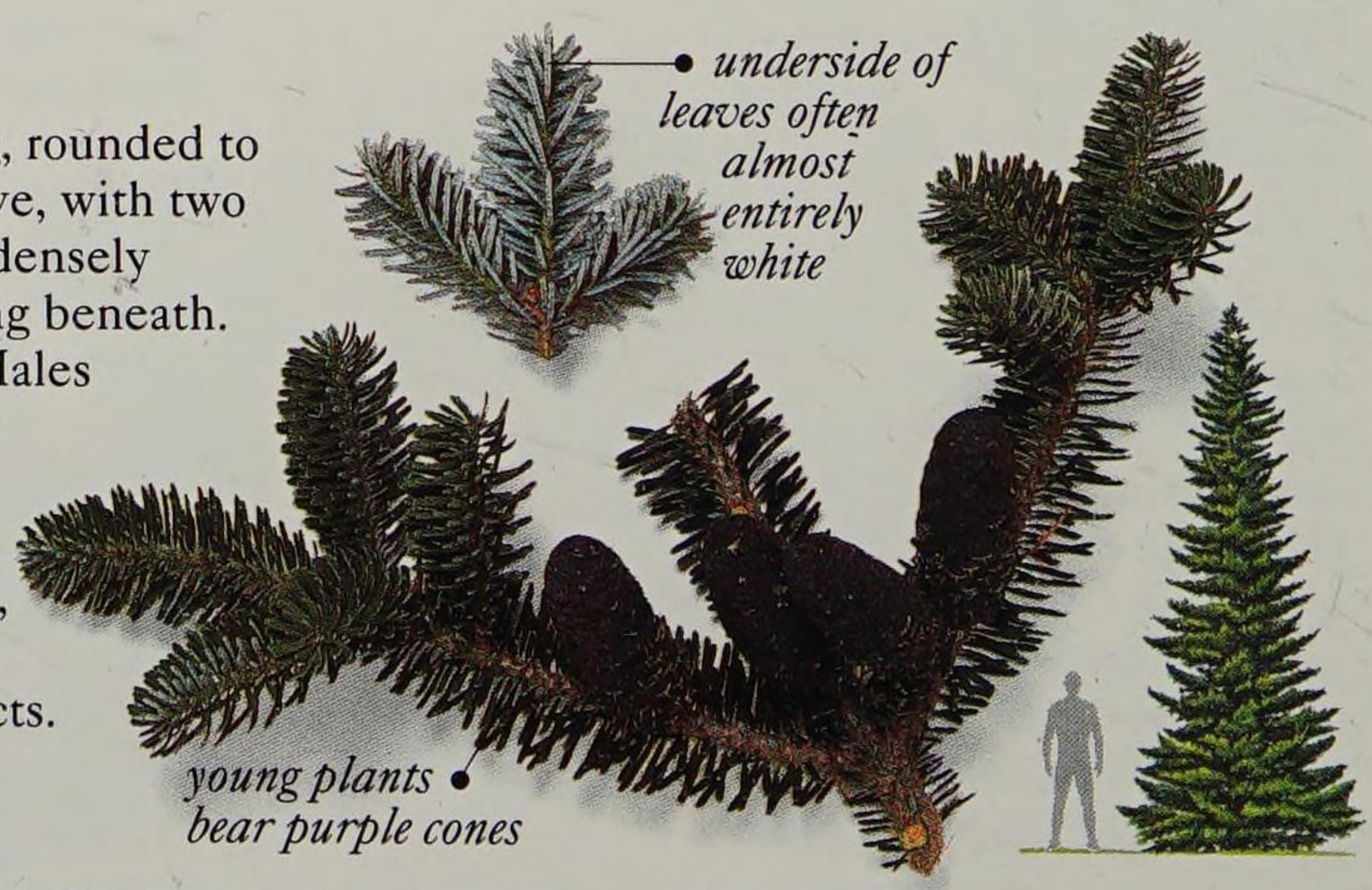
Family PINACEAE	Species *Abies koreana*	Author Wilson

KOREAN FIR

Leaves Linear, to ¾ in (2 cm) long, rounded to notched at the tip, dark green above, with two white bands or all white beneath, densely arranged above the shoot, spreading beneath. ***Bark*** Dark gray-brown. ***Flowers*** Males yellow, beneath the shoot, females reddish purple, upright, borne in separate clusters on the same plant in spring. ***Fruit*** A cylindrical, upright cone, to 3 in (7.5 cm) long, with protruding, down-curved bracts.

• **NATIVE REGION** S. Korea.

• **HABITAT** Mountains.



Height 50 ft (15 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Abies lasiocarpa*	Author (W.J. Hooker) Nuttall

ALPINE FIR

Leaves Linear, to 1½ in (4 cm) long, with a notched tip, gray-green above, with two white bands beneath, arranged upright above the shoot, the central leaves pointing forward, spreading beneath. ***Bark*** Gray-white, smooth, with resin blisters. ***Flowers*** Males tinged red opening yellow, beneath the shoot, females purple, upright, in separate clusters on the same plant in spring. ***Fruit*** A cylindrical, upright cone, to long, deep purple ripening to brown.

• **NATIVE REGION** W. North America.

• **HABITAT** From sea level to the mountains.

ABIES LASIOCARPA ▷

two narrow, white bands on underside of leaves

VAR. ARIZONICA ▷
This form, commonly known as the corkbark fir, comes from the south of the region. It is distinguished by its bluer leaves and corky bark.

Height 100 ft (30 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Abies magnifica*	Author Murray

CALIFORNIA RED FIR

Leaves Linear, to 1½ in (4 cm) long, bluntly pointed, gray-green, arranged upright above the shoot, spreading to upswept beneath. ***Bark*** Gray, rough, corky; red in very old plants. ***Flowers*** Males purple-red, beneath the shoot, females red, upright, in separate clusters on the same plant in spring. ***Fruit*** A broadly cylindrical, upright cone, 8 in (20 cm) or more long, purple at first becoming yellow-green ripening to brown.

• **NATIVE REGION** California, S. Oregon.

• **HABITAT** Dry mountain slopes and ridges.

• **REMARK** Also known as red fir.

leaves sweep upward from shoot

Height 130 ft (40 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Abies nordmanniana*	Author (Steven) Spach

CAUCASIAN FIR

Leaves Linear, to 1½ in (4 cm) long, with a notched tip, glossy bright green above, with two white bands beneath, dense above the shoot, spreading beneath. ***Bark*** Gray and smooth, cracking into small, square plates with age. ***Flowers*** Males reddish, beneath the shoot, females green, upright, in separate clusters on the same plant in spring. ***Fruit*** A broadly cylindrical upright cone, to 6 in (15 cm) long, green ripening to purple-brown, with protruding, down-curved bracts.

• **NATIVE REGION** Caucasus, N.E. Turkey.

• **HABITAT** Mountain forests.

Height 164 ft (50 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Abies numidica*	Author Carrière

ALGERIAN FIR

Leaves Linear and rigid, to ¾ in (2 cm) long, rounded or notched at the tip, dark gray-green above, with a small whitish patch toward the tip, with two white bands beneath, densely arranged all around the shoot, upright above, spreading beneath. ***Bark*** Gray-purple, smooth, flaking with age. ***Flowers*** Males tinged red opening yellow, beneath the shoot, females green, upright, in separate clusters on the same plant in spring. ***Fruit*** A cylindrical, upright cone, to 7¼ in (18 cm) long, purple-green ripening to brown, ending in an abrupt point.

• **NATIVE REGION** Algeria.

• **HABITAT** Mountains near the coast.

• **REMARK** A rare species in the wild. It is closely related to the Spanish fir (*Abies pinsapo*, see p.57).

Height 80 ft (25 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Abies pinsapo*	Author Boissier

SPANISH FIR

Leaves Linear and rigid, to ¾ in (2 cm) long, bluntly pointed, gray-green to gray-blue, densely arranged and standing out all around the shoot. ***Bark*** Dark gray, cracking into small plates with age. ***Flowers*** Males red opening yellow, beneath the shoot, females green, upright, borne in separate clusters on the same plant in spring. ***Fruit*** A cylindrical upright cone, to 6 in (15 cm) long, green ripening to brown.

- NATIVE REGION S. Spain.
- HABITAT Dry mountain slopes.

Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Abies procera*	Author Rehder

NOBLE FIR

Leaves Linear, to 1¼ in (3 cm) long, bluntly pointed, grooved above, gray-green to gray-blue. ***Bark*** Pale silvery gray or purplish, shallowly fissured with age. ***Flowers*** Males red tinged yellow, beneath the shoot, females reddish or green, upright, in separate clusters on the same plant in spring. ***Fruit*** A broadly cylindrical, purple-brown, upright cone, to 10 in (25 cm) long, with protruding, downcurved bracts.

- NATIVE REGION W. United States.
- HABITAT West-facing mountain slopes.

Height 164 ft (50 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Abies veitchii*	Author Lindley

ABIES VEITCHII

Leaves Linear, to 1¼ in (3 cm) long, with a notched tip, glossy dark green above, with two blue-white bands beneath, dense and pointing forward along the shoot, spreading beneath. ***Bark*** Gray, smooth, scaly with age. ***Flowers*** Males reddish opening yellow, beneath the shoot, females red-purple, upright, in separate clusters on the same plant in late spring. ***Fruit*** A cylindrical, upright cone, to 3 in (7.5 cm) long, blue-purple ripening to brown.

- NATIVE REGION Japan.
- HABITAT Evergreen mountain forests.

Height 80 ft (25 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Cedrus atlantica*	Author Manetti

ATLAS CEDAR

Leaves Needlelike and slender, to ¾ in (2 cm) long, borne singly on long shoots, in dense whorls on very slow-growing, shorter side shoots, sharp-pointed, gray-green to dark green, on hairy shoots. ***Bark*** Dark gray on old trees fissured into scaly plates. ***Flowers*** Males yellow, females green, both carried upright, in separate clusters on the same plant in autumn. ***Fruit*** A barrel-shaped upright cone, to 3 in (7.5 cm) long, green-purple when young becoming purple-brown ripening to brown, ripe in two to three years, breaking up before falling.

• **NATIVE REGION** Algeria, Morocco.

• **HABITAT** Forests.

• **REMARK** The species is sometimes listed as a geographical subspecies of the cedar of Lebanon *(Cedrus libani*, see p.59), from which it is usually most easily distinguished by its habit. In the wild, it is found only in North Africa's Atlas Mountains, a mountain range that lies between the Mediterranean and the Sahara.

Δ F. GLAUCA
The blue cedar is the form most commonly seen in gardens. It has bright gray-blue foliage.

Height 130 ft (40 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Cedrus brevifolia*	Author Henry

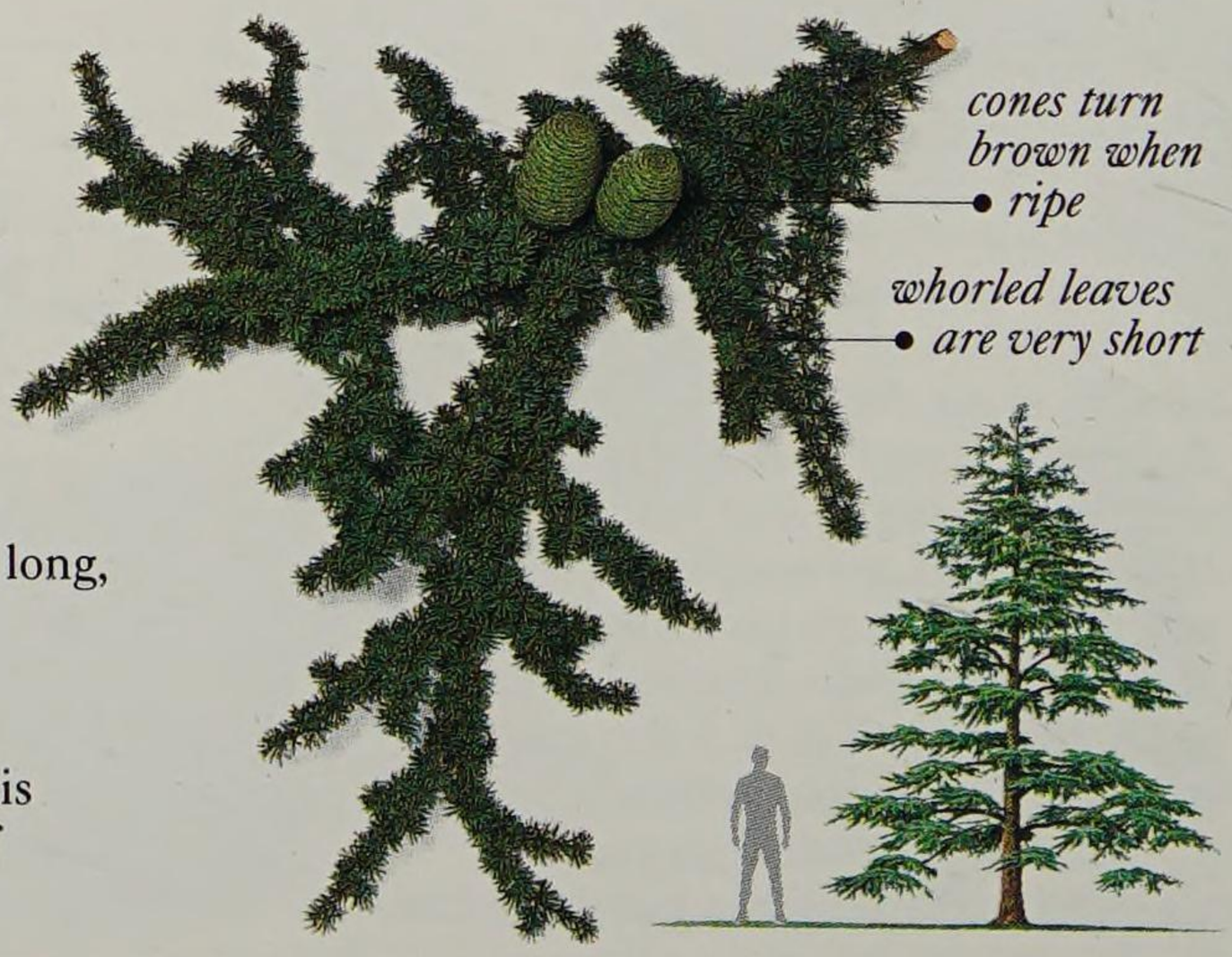
CYPRIAN CEDAR

Leaves Needlelike, to ¾ in (2 cm) long, borne singly on long shoots, in dense whorls on slow-growing side shoots, dark green. ***Bark*** Dark gray, cracking into vertical plates. ***Flowers*** Males blue-green, females green, both carried upright, in separate clusters on the same plant in autumn. ***Fruit*** A cylindrical upright cone, to 2¾ in (7 cm) long, purple-green at first ripening to brown.

• **NATIVE REGION** Cyprus.

• **HABITAT** Mountains.

• **REMARK** Short leaves distinguish this species from the closely related cedar of Lebanon *(Cedrus libani*, see p.59).



Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Cedrus deodara*	Author G. Don

DEODAR

Leaves Needlelike, to 1½ in (4 cm) long, borne singly on long shoots, in dense whorls on slow-growing side shoots, green to gray-green, the shoots drooping conspicuously at the tip. ***Bark*** Dark gray, cracking vertically with age. ***Flowers*** Males purple opening yellow, upright, females green, upright, borne in separate clusters on the same plant in autumn. ***Fruit*** A barrel-shaped upright cone, to 4¾ in (12 cm) long, green ripening to purple-brown.

• **NATIVE REGION** W. Himalayas.

• **HABITAT** Mountain forests.

• **REMARK** Also known as Himalayan cedar.

Height 164 ft (50 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Cedrus libani*	Author A. Richard

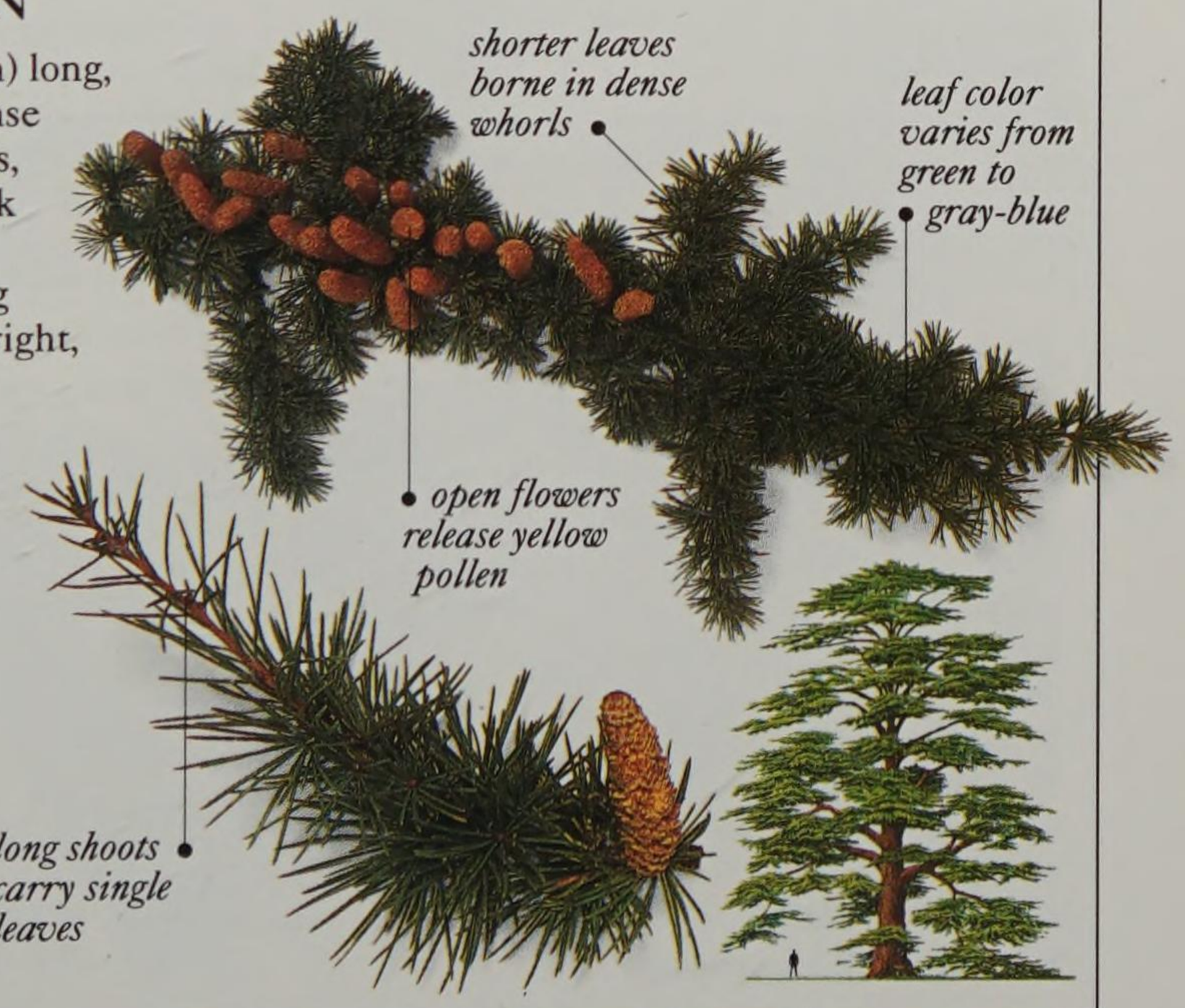
CEDAR OF LEBANON

Leaves Needlelike, to 1¼ in (3 cm) long, borne singly on long shoots, in dense whorls on slow-growing side shoots, dark green to gray-blue. ***Bark*** Dark gray, cracking into vertical plates. ***Flowers*** Males blue-green opening yellow, upright, females green, upright, borne in separate clusters on the same plant in autumn. ***Fruit*** A barrel-shaped upright cone, to 4¾ in (12 cm) long, purple-green ripening to brown.

• **NATIVE REGION** Lebanon, S.W. Turkey.

• **HABITAT** Mountain forests.

• **REMARK** Old plants of this species have a distinctive characteristic: the foliage is carried in broad, flattened sprays of branches, and is held on several massive stems.



Height 130 ft (40 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Larix decidua*	Author Miller

EUROPEAN LARCH

Leaves Needlelike and soft, to 1½ in (4 cm) long, singly on long shoots, in dense whorls on side shoots, bright green, turning yellow in autumn. ***Bark*** Gray becoming red-brown, fissured, and scaly. ***Flowers*** Males yellow, drooping, females red, upright, in separate clusters on the same plant in spring. ***Fruit*** An egg-shaped, brown, upright cone, about 1½ in (4 cm) long.

• **NATIVE REGION** Europe.

• **HABITAT** Mountains.

Height 130 ft (40 m)	Shape Narrowly conical	Leaf persistence Deciduous	Leaf type

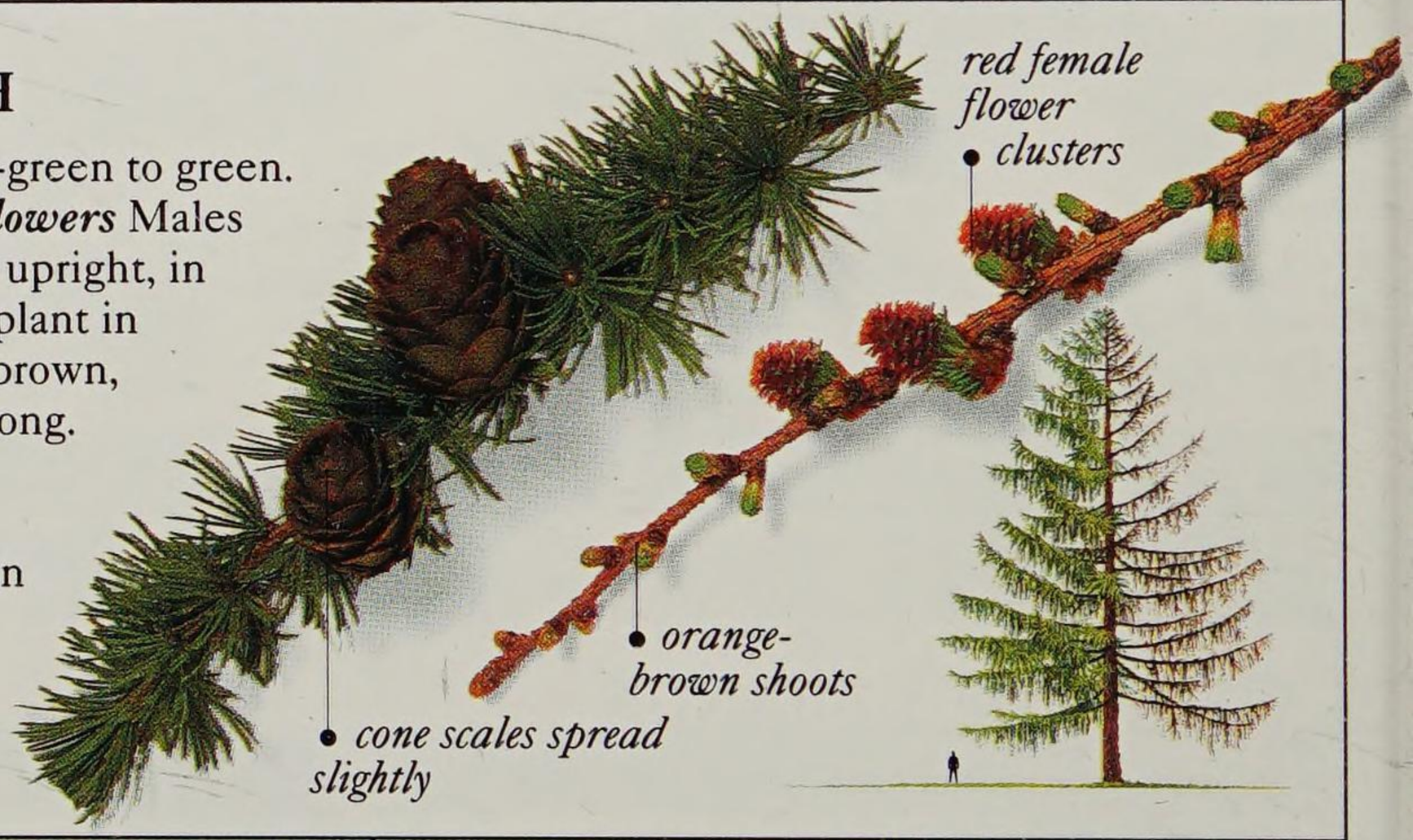
Family PINACEAE	Species *Larix* x *eurolepis*	Author Henry

DUNKELD LARCH

Leaves Needlelike, soft, gray-green to green. ***Bark*** Reddish brown, scaly. ***Flowers*** Males yellow, drooping, females red, upright, in separate clusters on the same plant in spring. ***Fruit*** An egg-shaped, brown, upright cone, to 1¼ in (3 cm) long.

• **NATIVE REGION** Of garden origin.

• **REMARK** A hybrid between the European larch *(Larix decidua*, see above) and the Japanese larch *(Larix kaempferi*, see below).



Height 115 ft (35 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

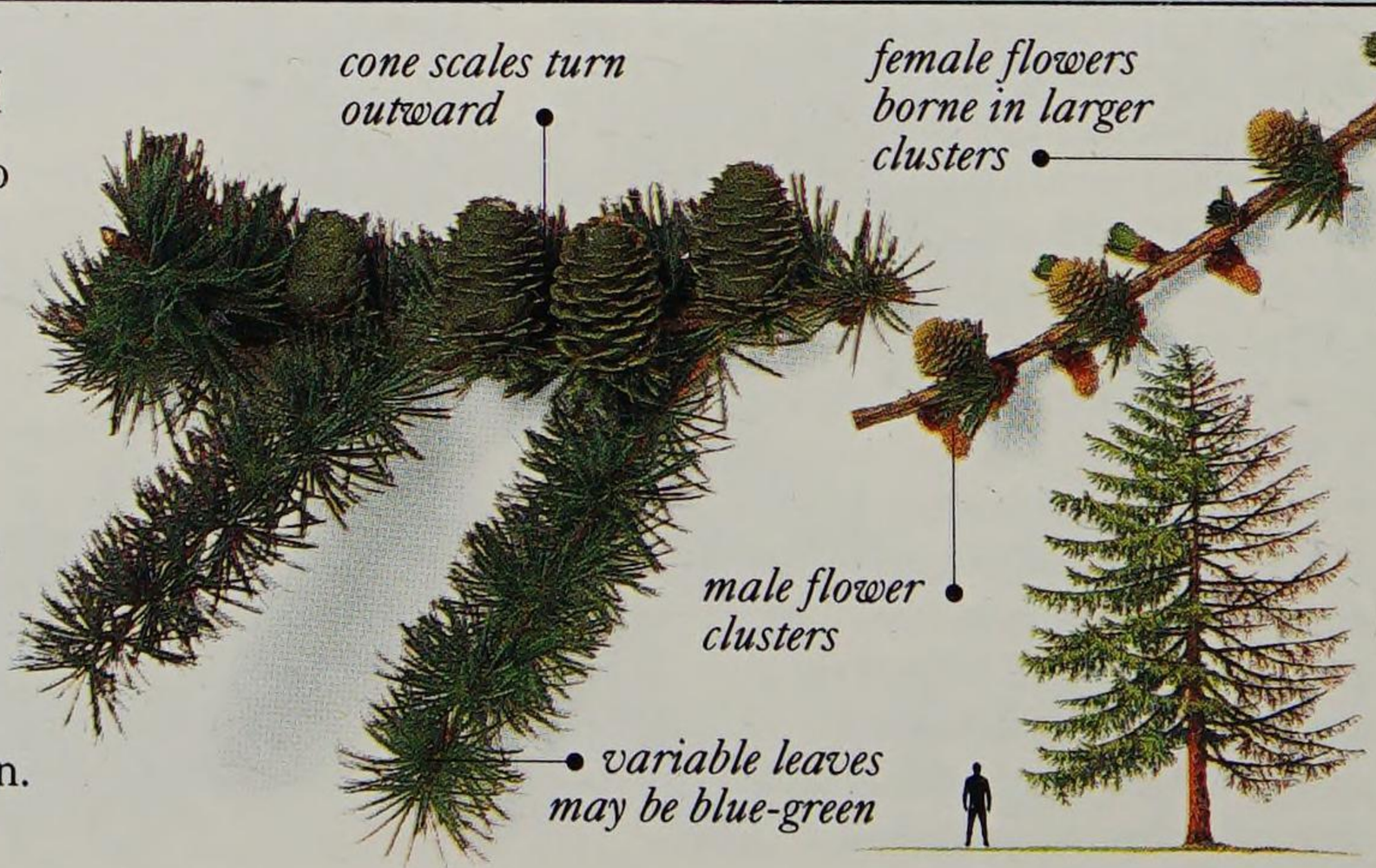
Family PINACEAE	Species *Larix kaempferi*	Author (A.B. Lambert) Carrière

JAPANESE LARCH

Leaves Needlelike and soft, to 1½ in (4 cm) long, singly on long shoots, whorled on side shoots, gray-green to blue-green. ***Bark*** Reddish brown, scaly. ***Flowers*** Males yellow, drooping, females creamy or pinkish, upright, in separate clusters on the same plant in spring. ***Fruit*** An egg-shaped, upright cone, to 1¼ in (3 cm)

• **NATIVE REGION** C. Japan.

• **HABITAT** Mountains.



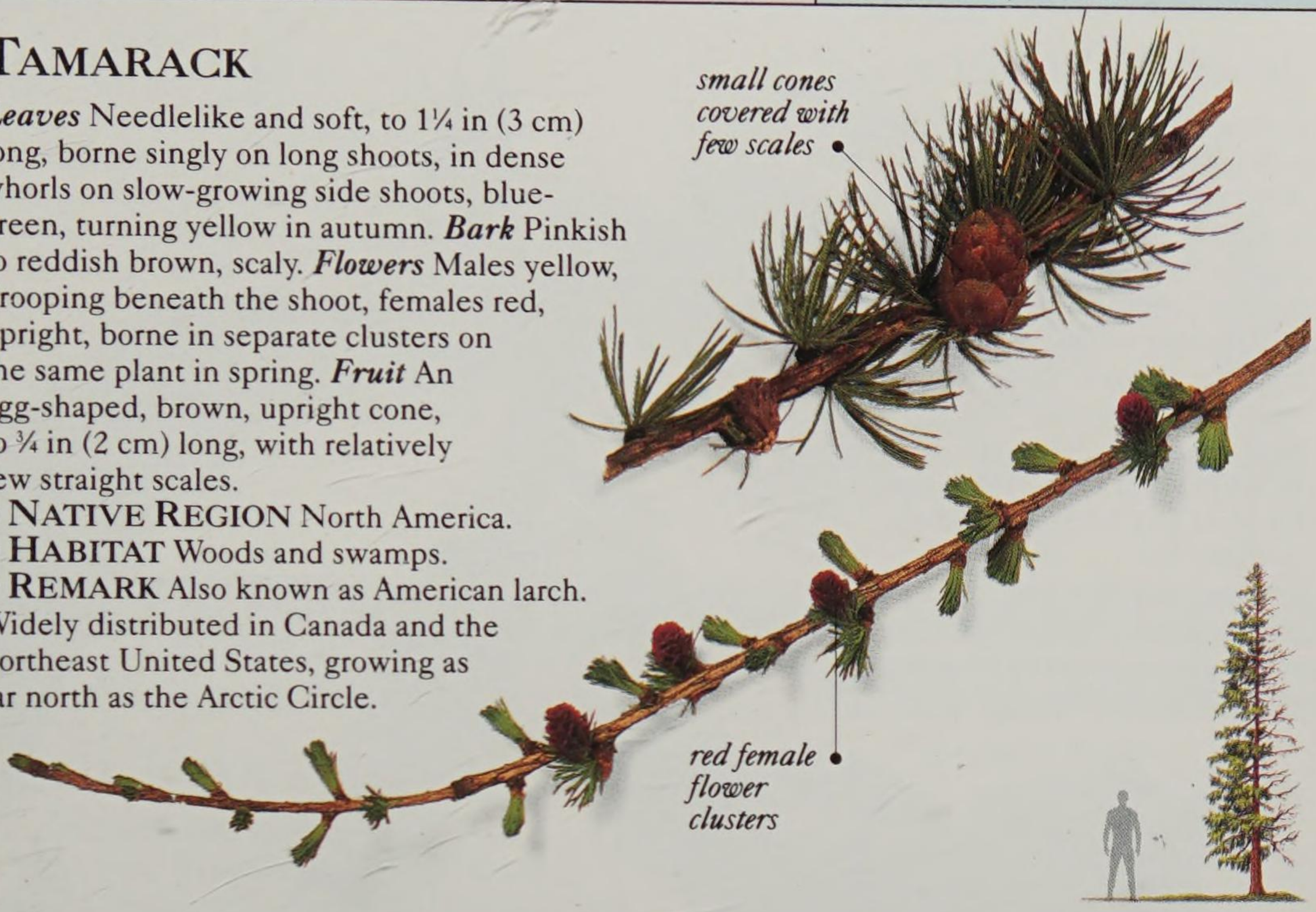
Height 100 ft (30 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family PINACEAE	Species *Larix laricina*	Author (Du Roi) K. Koch

TAMARACK

Leaves Needlelike and soft, to 1¼ in (3 cm) long, borne singly on long shoots, in dense whorls on slow-growing side shoots, blue-green, turning yellow in autumn. ***Bark*** Pinkish to reddish brown, scaly. ***Flowers*** Males yellow, drooping beneath the shoot, females red, upright, borne in separate clusters on the same plant in spring. ***Fruit*** An egg-shaped, brown, upright cone, to ¾ in (2 cm) long, with relatively few straight scales.

- **NATIVE REGION** North America.
- **HABITAT** Woods and swamps.
- **REMARK** Also known as American larch. Widely distributed in Canada and the northeast United States, growing as far north as the Arctic Circle.



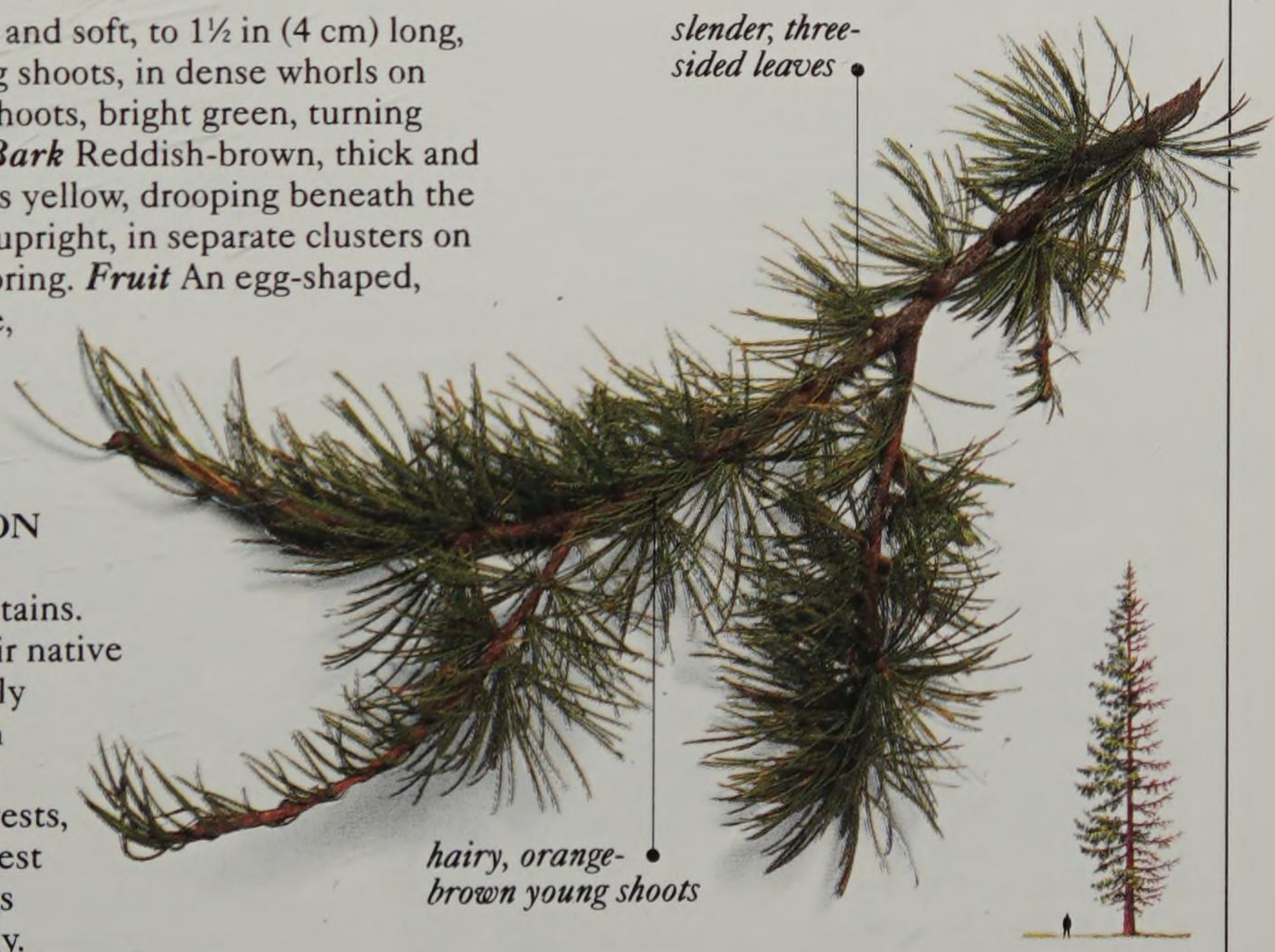
Height 65 ft (20 m)	Shape Narrowly conical	Leaf persistence Deciduous	Leaf type

Family PINACEAE	Species *Larix occidentalis*	Author Nuttall

WESTERN LARCH

Leaves Needlelike and soft, to 1½ in (4 cm) long, borne singly on long shoots, in dense whorls on slow-growing side shoots, bright green, turning yellow in autumn. ***Bark*** Reddish-brown, thick and scaly. ***Flowers*** Males yellow, drooping beneath the shoot, females red, upright, in separate clusters on the same plant in spring. ***Fruit*** An egg-shaped, brown, upright cone, to 1½ in (4 cm) long, with bracts protruding from between the scales.

- **NATIVE REGION** W. North America.
- **HABITAT** Mountains.
- **REMARK** In their native region, plants quickly attain the maximum height. The species often forms pure forests, particularly after forest fires, when seedlings germinate prolifically.



Height 164 ft (50 m)	Shape Narrowly conical	Leaf persistence Deciduous	Leaf type

Family PINACEAE	Species *Picea abies*	Author (Linnaeus) Karsten

NORWAY SPRUCE

Leaves Needlelike, slender, and rigid, to ¾ in (2 cm) long, four-sided, with a sharp point at the tip, dark green, spreading beneath smooth, brown shoots. ***Bark*** Red-brown to gray, peeling in thin strips. ***Flowers*** Males red opening yellowish, females red, borne in separate, upright clusters on the same plant in spring. ***Fruit*** A cylindrical, brown, hanging cone, to 6 in (15 cm) long.

• **NATIVE REGION** Europe.

• **HABITAT** Mountain forests, on damp soil.

• **REMARK** This important species has many varieties and cultivars. It is widely planted for the commercial value of its timber.

Height 164 ft (50 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Picea breweriana*	Author Watson

BREWER SPRUCE

Leaves Needlelike, slender, often curved, to 1¼ in (3 cm) long, flattened, blunt, dark green, with two whitish bands beneath, arranged all around the shoot. ***Bark*** Gray-purple, scaly with age. ***Flowers*** Males red opening yellowish, females red or green, in separate clusters on the same plant in spring. ***Fruit*** A narrowly cylindrical, brown, hanging cone, to 4¾ in (12 cm) long.

• **NATIVE REGION** N. California, S. Oregon.

• **HABITAT** Mountains.

Height 115 ft (35 m)	Shape Narrowly weeping	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Picea glauca*	Author (Moench) Voss

WHITE SPRUCE

Leaves Needlelike, slender, and rigid, to ⅝ in (1.5 cm) long, four-sided, blue-green, with white bands, densely arranged pointing forward above smooth, nearly white shoots. ***Bark*** Gray-brown and scaly. ***Flowers*** Males red opening yellow, females purple-red, borne in separate clusters on the same plant in spring. ***Fruit*** A cylindrical, pale brown, hanging cone, to 2½ in (6 cm) long.

• **NATIVE REGION** Canada, N.E. United States.

• **HABITAT** Woods.

Height 100 ft (30 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

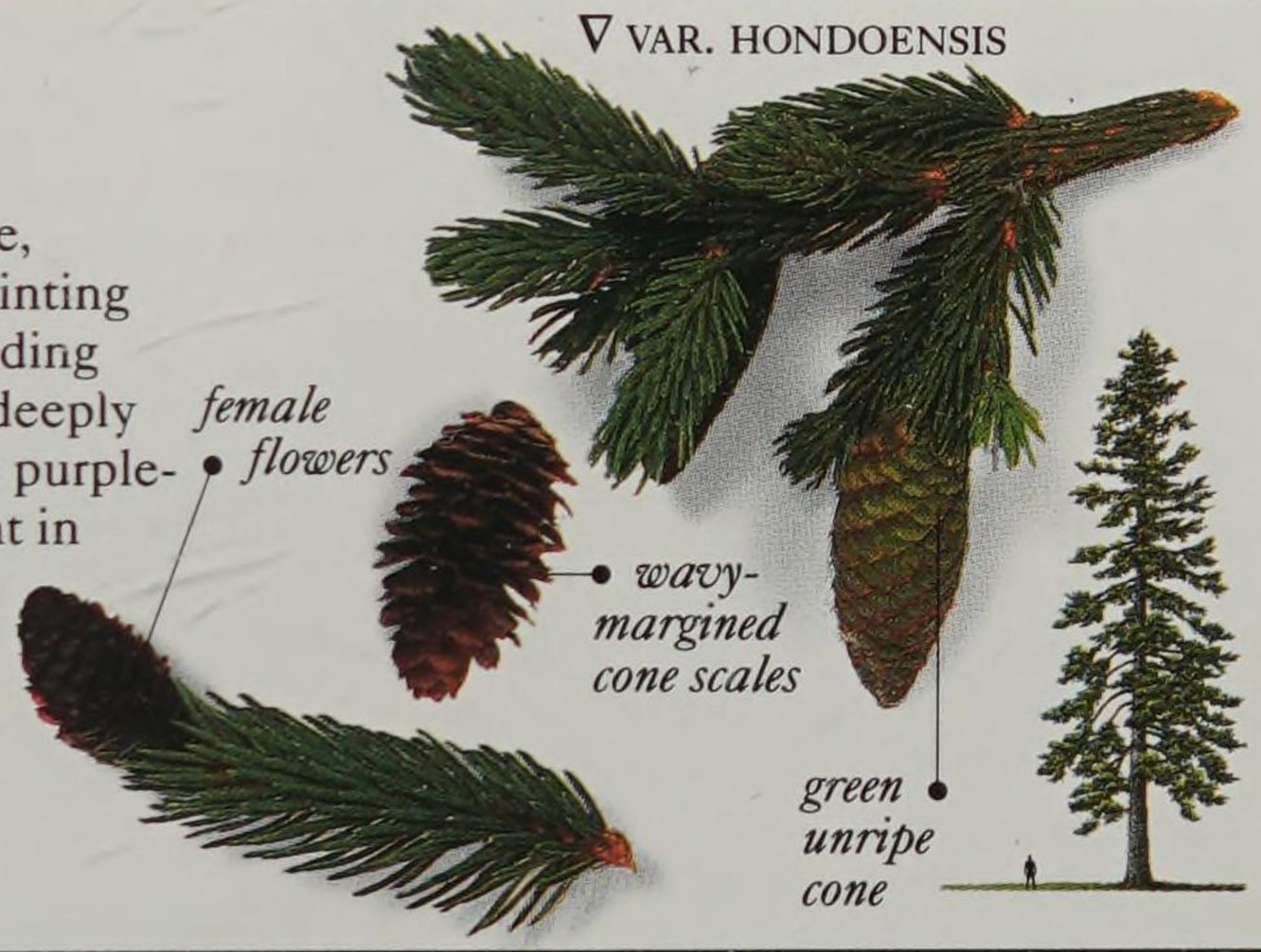
Family PINACEAE	Species *Picea jezoensis*	Author (Siebold & Zuccarini) Carrière

YEZO SPRUCE

Leaves Needlelike and slender, to ⅝ in (1.5 cm) long, flattened, dark green above, with two broad, white bands beneath, pointing forward above smooth, pale shoots, spreading beneath. ***Bark*** Gray-brown, flaking and deeply fissured. ***Flowers*** Males reddish, females purple-red, in separate clusters on the same plant in spring. ***Fruit*** A cylindrical, red-brown, hanging cone, to 3 in (7.5 cm) long.

• **NATIVE REGION** N.E. Asia, Japan.

• **HABITAT** Subalpine forests on steep slopes and dry plateaus.



Height 164 ft (50 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

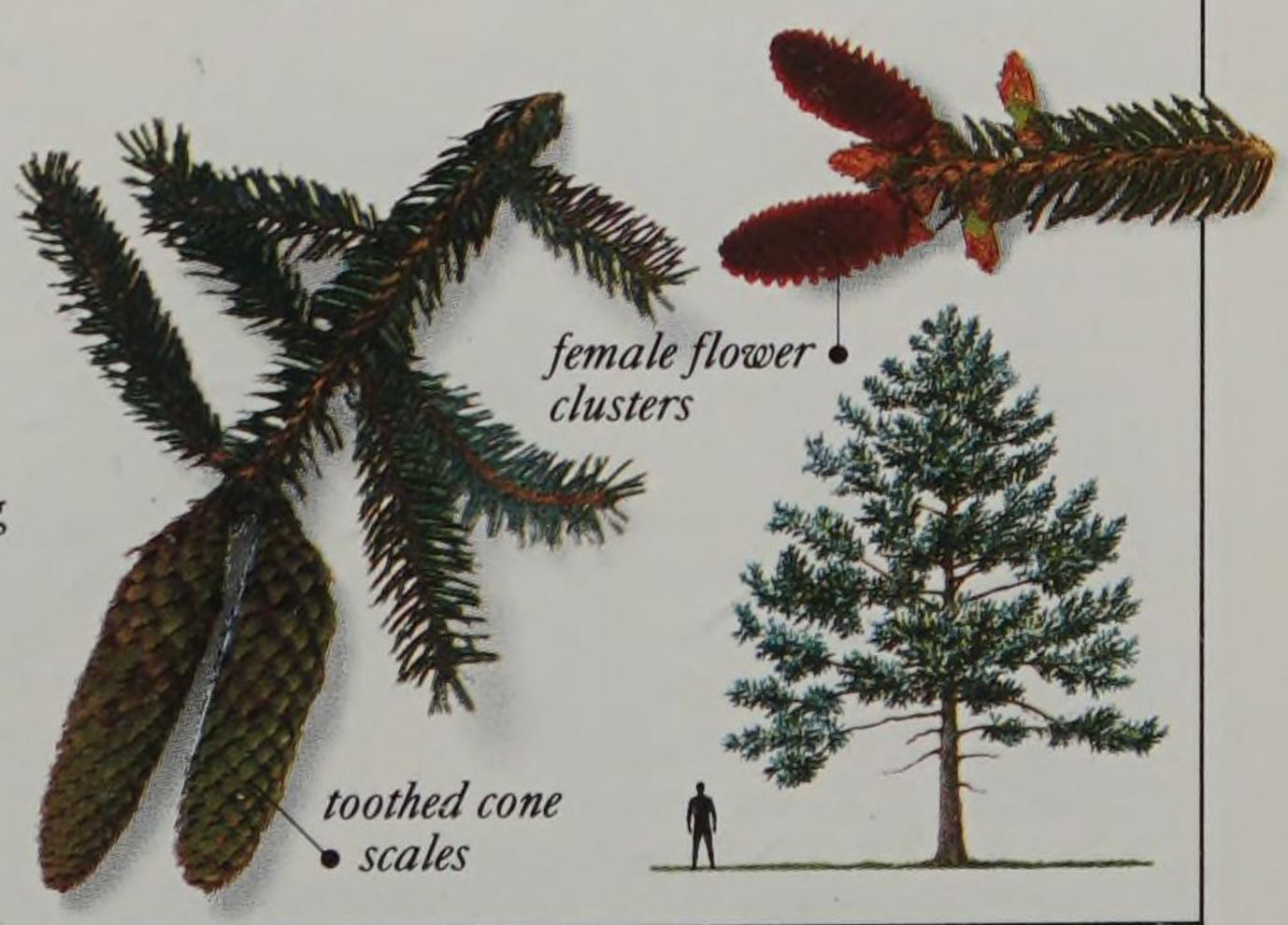
Family PINACEAE	Species *Picea likiangensis*	Author (Franchet) Pritzel

PICEA LIKIANGENSIS

Leaves Needlelike and slender, to ⅝ in (1.5 cm) long, sharp at the tip, blue-green above, blue-white beneath, pointing forward above usually hairy, pale brown shoots, spreading beneath. ***Bark*** Pale gray and scaly, fissured with age. ***Flowers*** Males and females both profuse, males red opening yellowish, females bright red, in separate clusters on the same plant in spring. ***Fruit*** A cylindrical, hanging cone, to 4 in (10 cm) long, purple ripening to pale brown.

• **NATIVE REGION** W. China, Tibet.

• **HABITAT** Mountain woods.



Height 100 ft (30 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Picea mariana*	Author (Miller) B.S.P.

BLACK SPRUCE

Leaves Needlelike and slender, to ⅝ in (1.5 cm) long, four-sided, bluntly pointed, blue-green above, blue-white beneath, borne all around hairy, yellow-brown shoots. ***Bark*** Gray-brown and flaking. ***Flowers*** Males and females both red, in separate clusters on the same plant in spring. ***Fruit*** An egg-shaped, red-brown, hanging cone, to 1½ in (4 cm) long.

• **NATIVE REGION** Canada, N.E. United States.

• **HABITAT** Mountain slopes and bogs.

Height 100 ft (30 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

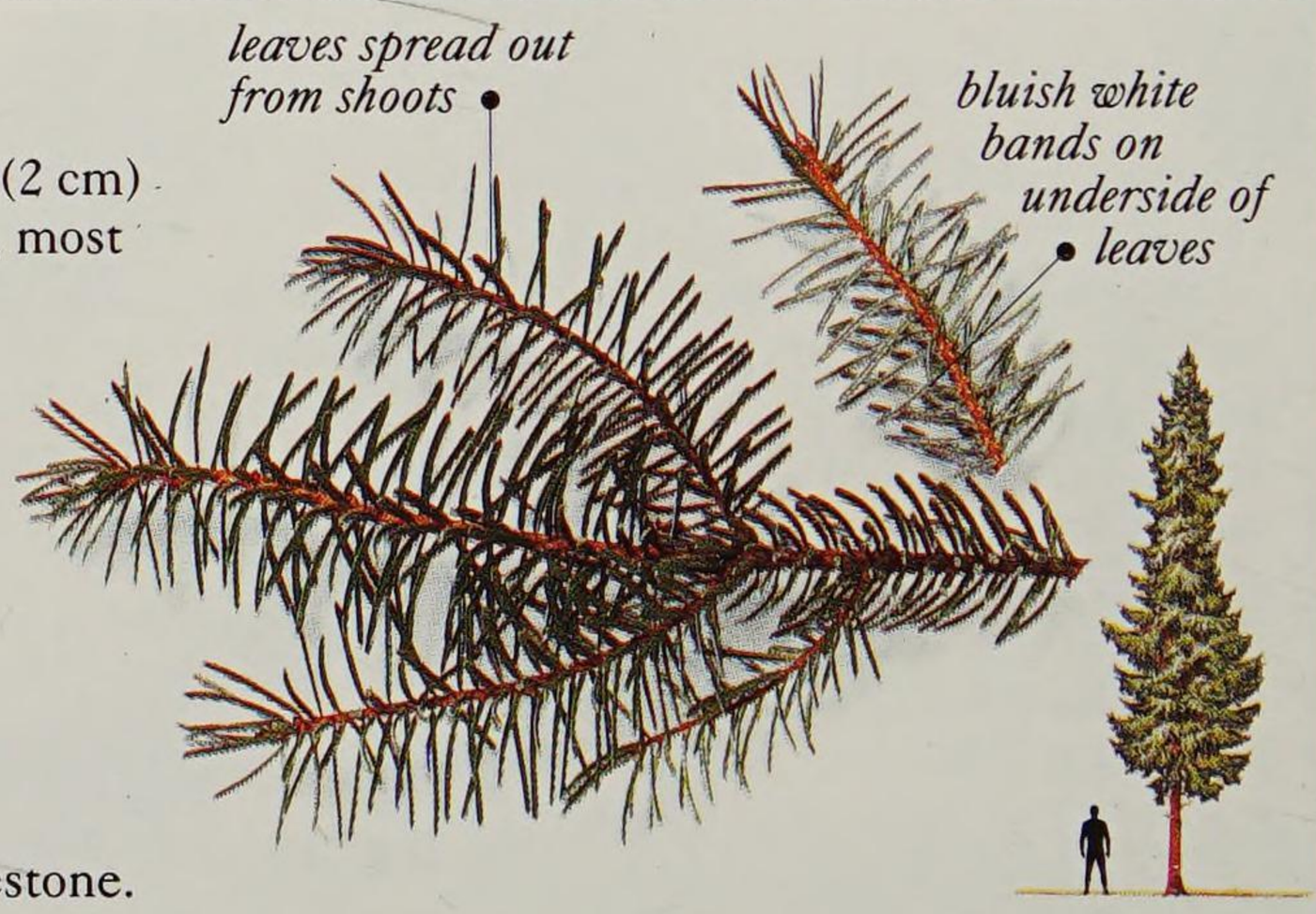
Family PINACEAE	Species *Picea omorika*	Author (Pančić) Purkyně

SERBIAN SPRUCE

Leaves Needlelike and slender, to ¾ in (2 cm) long, flattened, glossy dark green above, most lying above but some all around hairy, pale brown shoots. ***Bark*** Purple-brown, cracking into square plates. ***Flowers*** Males and females both red, borne in separate clusters on the same plant in spring. ***Fruit*** A narrowly egg-shaped, purple-brown, hanging cone, to 2½ in (6 cm) long.

• **NATIVE REGION** Bosnia-Herzegovina/Yugoslavia.

• **HABITAT** Near River Drina, on limestone.



Height 100 ft (30 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Picea orientalis*	Author (Linnaeus) Link

ORIENTAL SPRUCE

Leaves Needlelike, to 5/16 in (8 mm) long, four-sided, bluntly pointed at the tip, glossy dark green, pointing forward all around hairy, whitish to pale brown shoots. ***Bark*** Pinkish brown, flaking in small plates. ***Flowers*** Males red opening yellow, females red, in separate clusters on the same plant in spring. ***Fruit*** A cylindrical, hanging cone, to 4 in (10 cm) long, purple ripening to brown.

• **NATIVE REGION** Caucasus, N.E. Turkey.

• **HABITAT** Mountain forests.

Height 164 ft (50 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

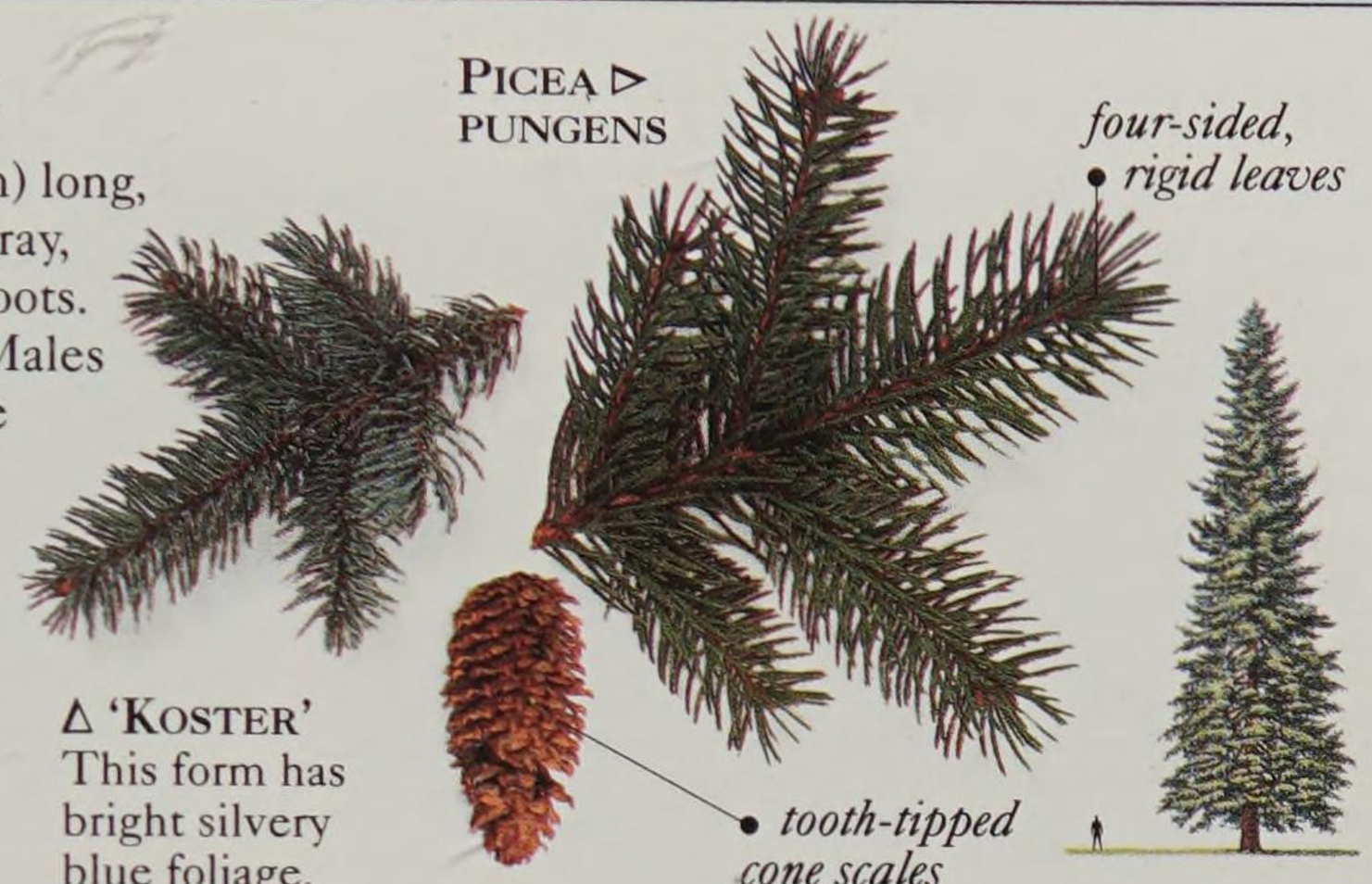
Family PINACEAE	Species *Picea pungens*	Author Engelmann

COLORADO SPRUCE

Leaves Needlelike, to 1¼ in (3 cm) long, spine-tipped, gray-green to blue-gray, arranged all around pale brown shoots. ***Bark*** Purple-gray, scaly. ***Flowers*** Males reddish, females green, in separate clusters on the same plant in late spring. ***Fruit*** A pale brown, hanging cone, to 4 in (10 cm) long.

• **NATIVE REGION**
W. United States.

• **HABITAT** High mountains, on dry slopes and streambanks.



Height 115 ft (35 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Picea sitchensis*	Author (Bongard) Carrière

SITKA SPRUCE

Leaves Needlelike, slender, to 1¼ in (3 cm) long, sharp-pointed, bright green above, with two white bands beneath, arranged all around whitish to pale brown shoots, parted beneath. ***Bark*** Gray and purple-gray, flaking in large scales. ***Flowers*** Males reddish, females green, borne in separate clusters on the same plant in spring. ***Fruit*** A cylindrical, pale brown, hanging cone, to 4 in (10 cm) long.

• **NATIVE REGION**
W. North America.

• **HABITAT** Coastal, moist lowland.

Height 164 ft (50 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

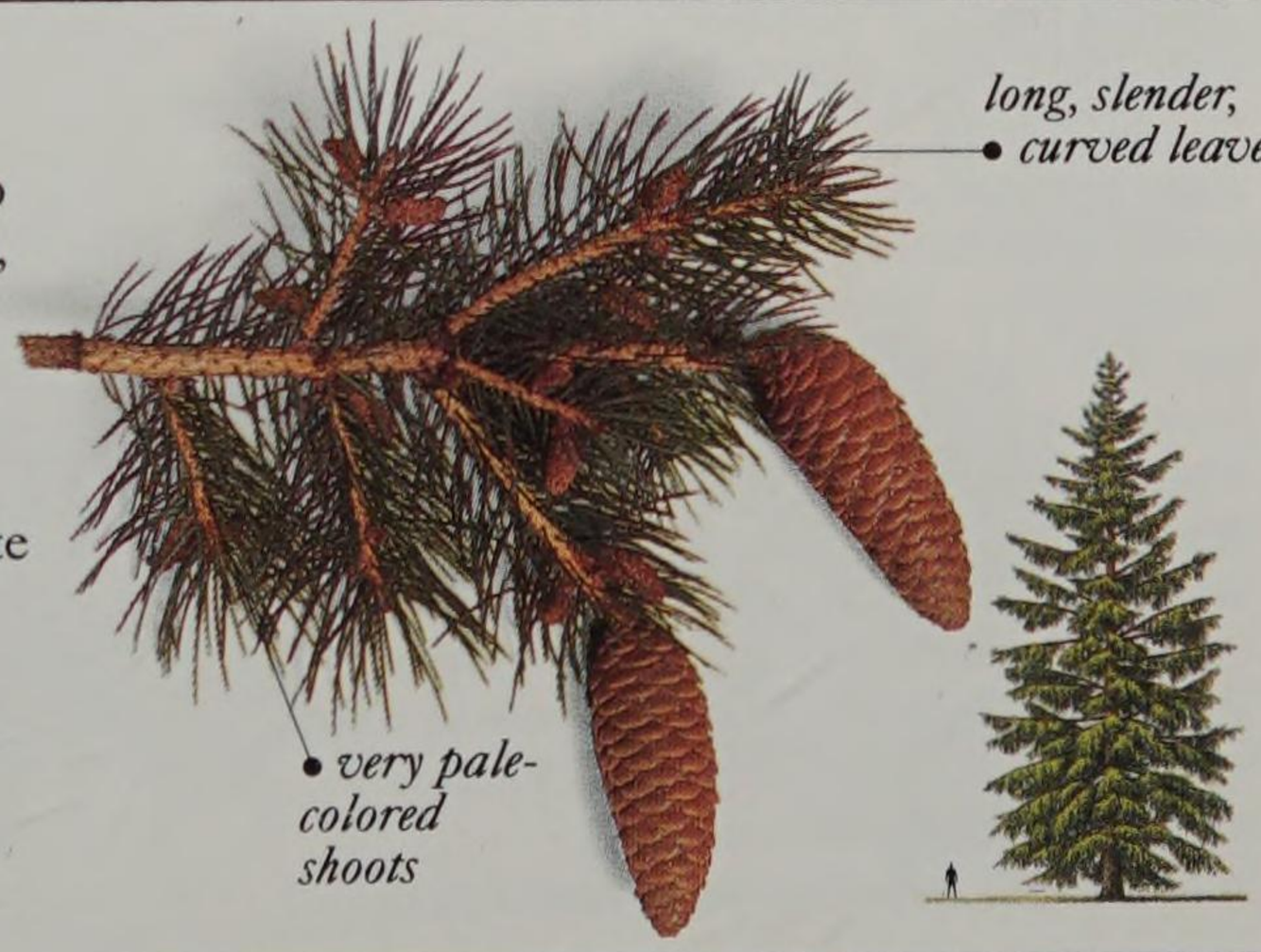
Family PINACEAE	Species *Picea smithiana*	Author (Wallich) Boissier

HIMALAYAN SPRUCE

Leaves Needlelike, long, and slender, to 1½ in (4 cm) long, four-sided, dark green, arranged all around smooth, glossy, pale brown, hanging shoots. ***Bark*** Purple-gray, flaking in scales. ***Flowers*** Males yellow-green, hanging, at the tips of the shoots, females green, upright, in separate clusters on the same plant in late spring to early summer. ***Fruit*** A hanging cone, to 8 in (20 cm) long, green ripening to glossy brown.

• **NATIVE REGION** W. Himalayas.

• **HABITAT** High evergreen forests.



Height 130 ft (40 m)	Shape Narrowly weeping	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus ayacahuite*	Author Ehrenberg

MEXICAN WHITE PINE

Leaves Needlelike and slender, to 6 in (15 cm) long, in clusters of five, blue-green, borne on finely hairy, yellow-brown shoots. ***Bark*** Gray, rough and coarsely fissured. ***Flowers*** Males yellow, females red, in separate clusters on the shoots in early summer. ***Fruit*** A cylindrical, yellow-brown, resinous, hanging cone, to 18 in (45 cm) long, with purple-tipped scales.

- **NATIVE REGION** N. Guatemala, Mexico.
- **HABITAT** Mountain slopes.

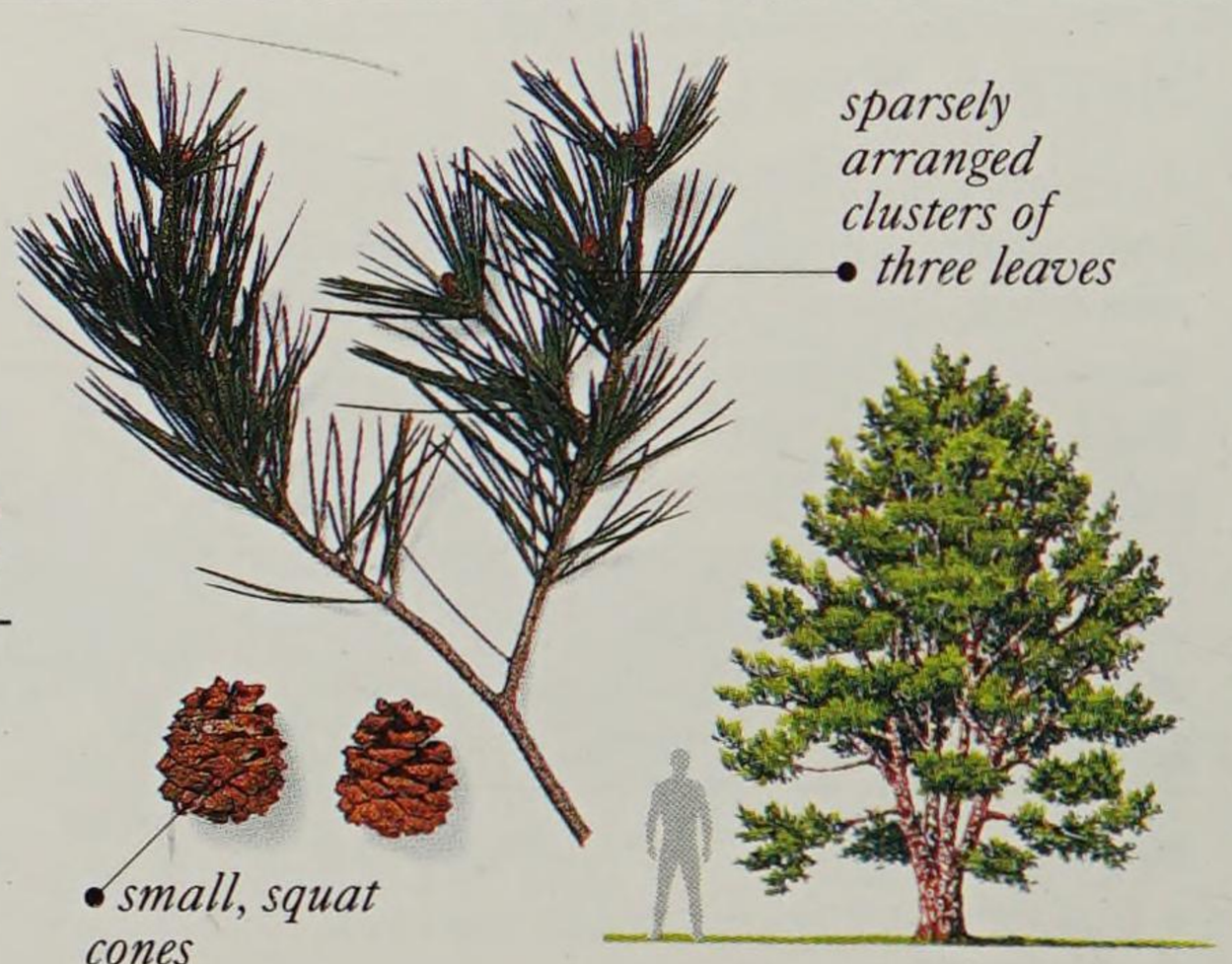
Height 115 ft (35 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus bungeana*	Author Zuccarini

LACE-BARK PINE

Leaves Needlelike and rigid, to 3 in (7.5 cm) long, in clusters of three, with a sharp point at the tip, yellow-green, borne on smooth, gray-green shoots. ***Bark*** Gray-green and creamy white, flaking in small patches. ***Flowers*** Males yellow, females green, borne in separate clusters on the young shoots in early summer. ***Fruit*** An egg-shaped, yellow-brown cone, to 2¾ in (7 cm) long, with spine-tipped scales.

- **NATIVE REGION** N. China.
- **HABITAT** Mainly steep mountain slopes, on shale.



Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus cembra*	Author Linnaeus

SWISS STONE PINE

Leaves Needlelike, to 3½ in (9 cm) long, in clusters of three, glossy green on the outer surface, blue-gray on the inner, on greenish shoots, the shoots covered in orange-brown hairs. ***Bark*** Gray-brown and scaly. ***Flowers*** Males purple opening yellow, females red, in separate clusters on the young shoots in late spring. ***Fruit*** An egg-shaped cone, to 3 in (7.5 cm) long, blue-purple ripening to red-brown, never opening fully.

- **NATIVE REGION** N. Asia, Europe.
- **HABITAT** Mountains.
- **REMARK** Also known as Arolla pine.

Height 65 ft (20 m)	Shape Narrowly columnar	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus contorta*	Author Loudon

BEACH PINE

Leaves Needlelike and twisted, to 2 in (5 cm) long, in pairs, densely arranged, dark green or yellow-green, on smooth, green-brown shoots. ***Bark*** Red-brown, fissured into small squares. ***Flowers*** Males yellow, females red, in separate clusters on the young shoots in late spring. ***Fruit*** An egg-shaped, pale brown cone, pointing backward along the shoot, to 2 in (5 cm) long, the scales with slender spines.

- **NATIVE REGION** W. North America.
- **HABITAT** Coastal dunes and bogs.
- **REMARK** Also known as shore pine. Widely distributed from Alaska to Mexico. The lodgepole pine, var. *latifolia*, can reach 100 ft (30 m) in mountain habitats.

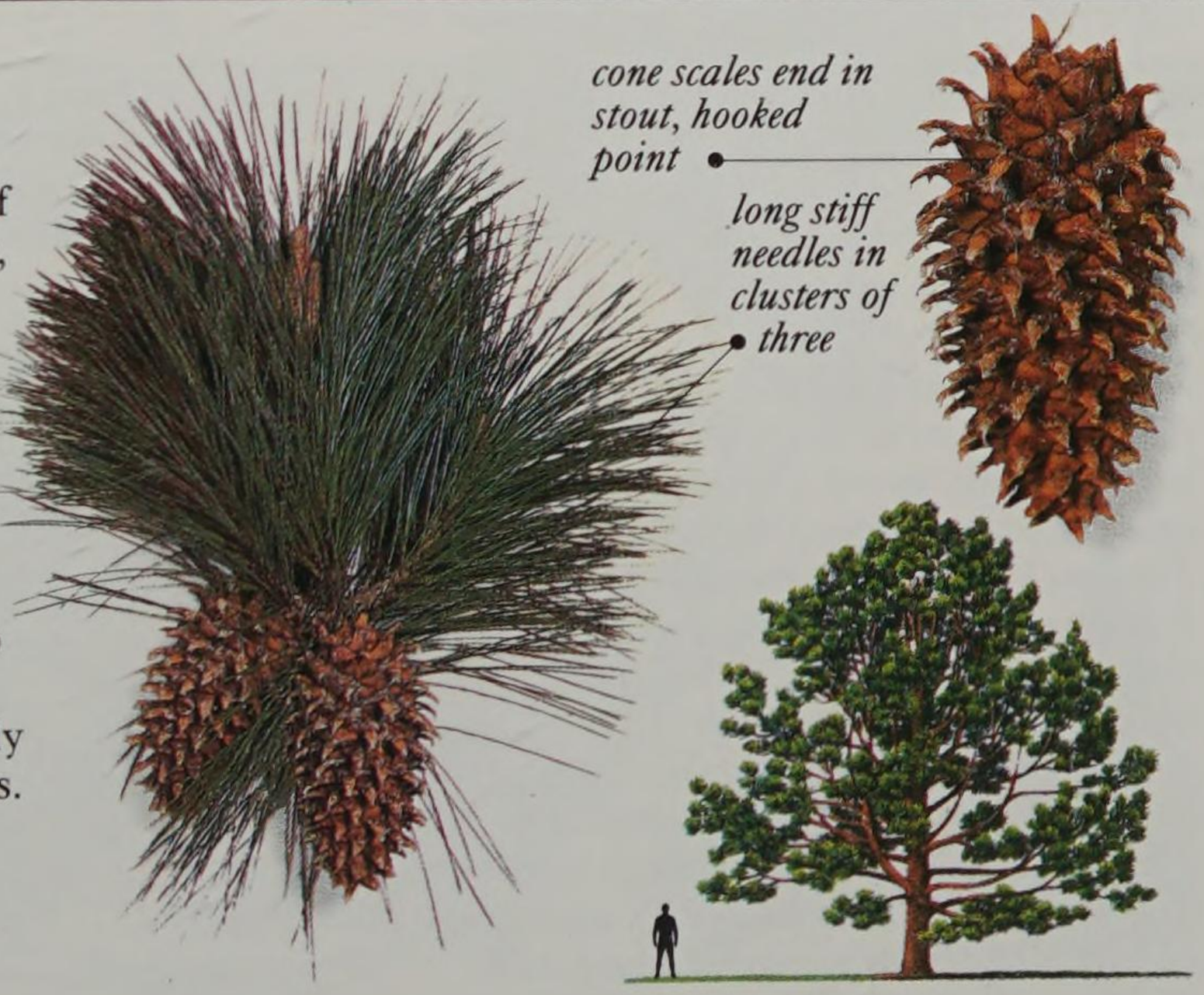
Height 33 ft (10 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus coulteri*	Author D. Don

BIG-CONE PINE

Leaves Needlelike and stiff, to 12 in (30 cm) long, in clusters of three, gray-green, on very stout, bloomy shoots. ***Bark*** Purple-brown, scaly, deeply fissured. ***Flowers*** Males purple opening yellow, females red, borne in separate clusters on the young shoots in late spring to early summer. ***Fruit*** An egg-shaped, yellow-brown, resinous cone, to 12 in (30 cm) long, the scales ending in hooked spines, usually remaining closed for many years.

- **NATIVE REGION** California.
- **HABITAT** Dry, rocky slopes in the mountains.



Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

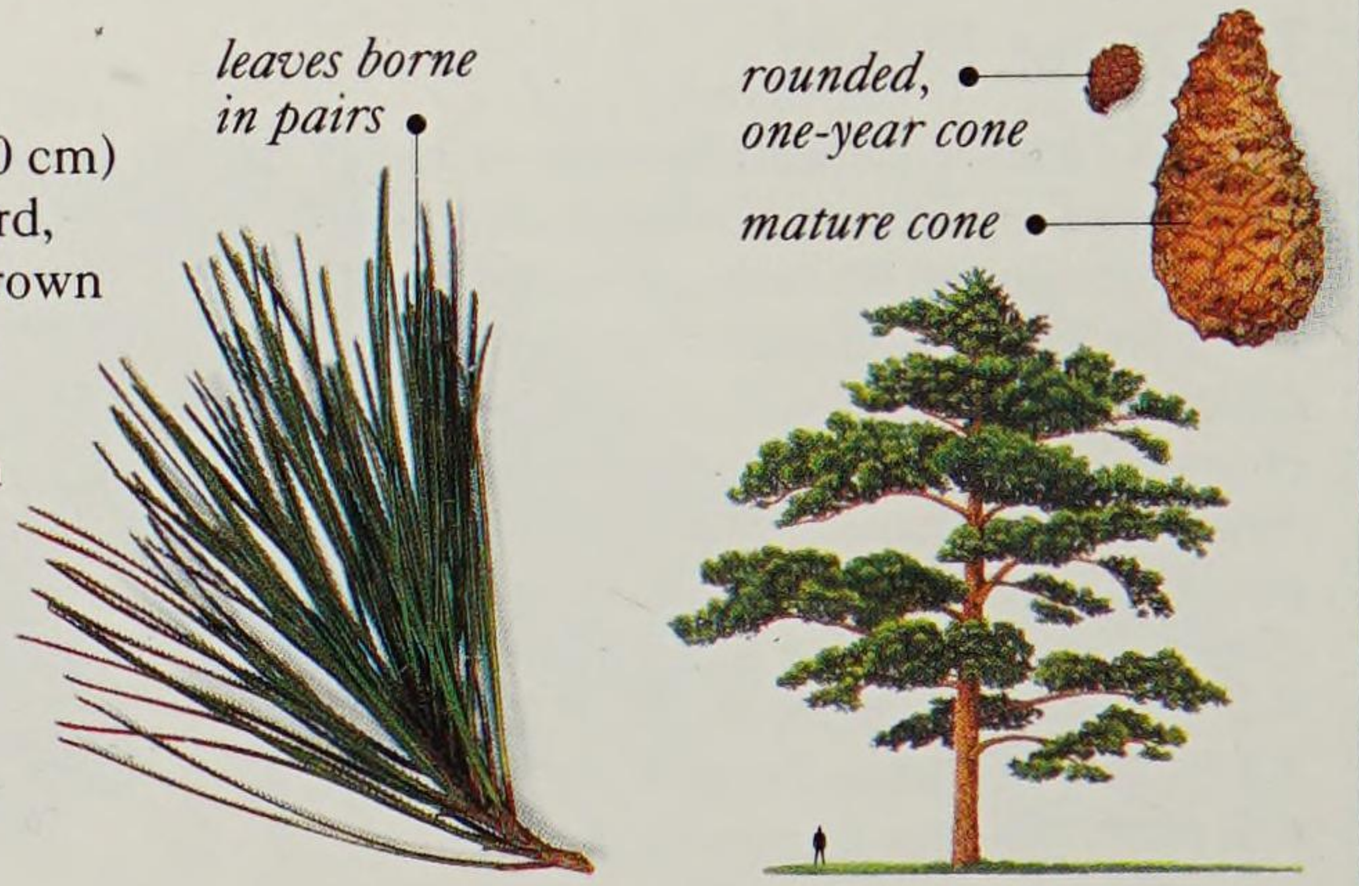
Family PINACEAE	Species *Pinus densiflora*	Author Siebold & Zuccarini

JAPANESE RED PINE

Leaves Needlelike and slender, to 4 in (10 cm) long, in pairs, bright green, pointing forward, on smooth, green shoots. ***Bark*** Reddish-brown becoming gray-red, cracking into irregular plates with age. ***Flowers*** Males yellow-brown, females red, in separate clusters on the young shoots in late spring. ***Fruit*** A conical, pale brown cone, to 2 in (5 cm) long, ripe in two years.

• **NATIVE REGION**
N.E. China, Japan, Korea.

• **HABITAT** Sea level to mountains.



Height 115 ft (35 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

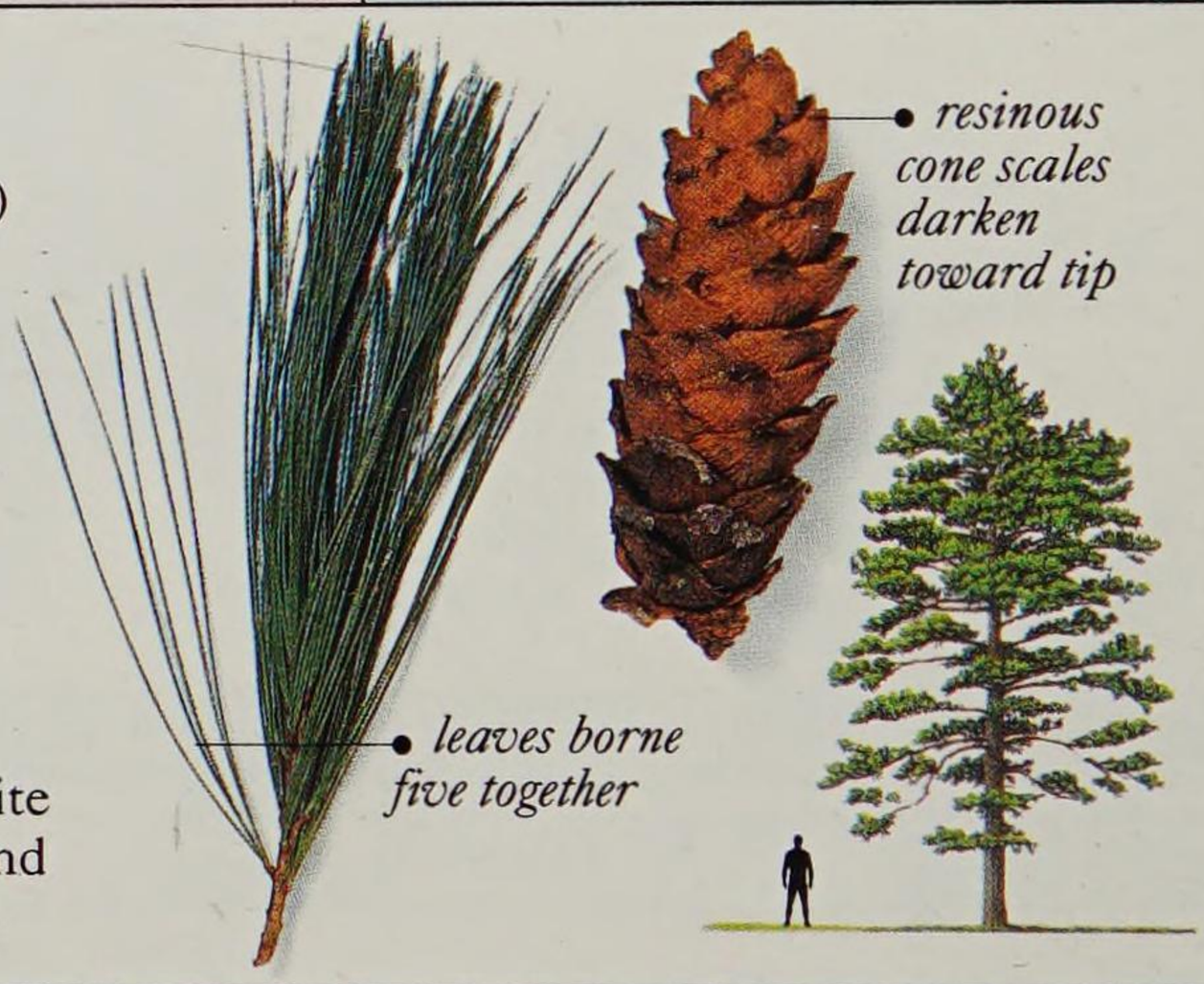
Family PINACEAE	Species *Pinus* x *holfordiana*	Author Jackson

PINUS X HOLFORDIANA

Leaves Needlelike, slender, to 7¼ in (18 cm) long, in clusters of five, the outer surface bright green, the inner surface blue-gray, borne on hairy, green shoots. ***Bark*** Gray and fissured. ***Flowers*** Males yellow, females red, in separate clusters on the young shoots in early summer. ***Fruit*** A resinous, orange-brown, hanging cone, to 12 in (30 cm) long.

• **NATIVE REGION** Of garden origin.

• **REMARK** A hybrid between Mexican white pine *(Pinus ayacahuite* var. *veitchii*, see p.66) and Himalayan pine *(Pinus wallichiana*, see p.75).



Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus jeffreyi*	Author Murray

JEFFREY PINE

Leaves Needlelike, rigid, to 10 in (25 cm) long, in clusters of three, blue-green, on stout, smooth, bloomy shoots. ***Bark*** Dark gray-brown, with deep, narrow fissures. ***Flowers*** Males red opening yellow, females red-purple, in separate clusters on the young shoots in early summer. ***Fruit*** A conical, yellow-brown cone, to 12 in (30 cm) long, the scales each with a slender, curved spine.

• **NATIVE REGION** W. United States.

• **HABITAT** Dry slopes on high mountains.

• **REMARK** Closely related to western yellow pine *(Pinus ponderosa*, see p.73).

Height 130 ft (40 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

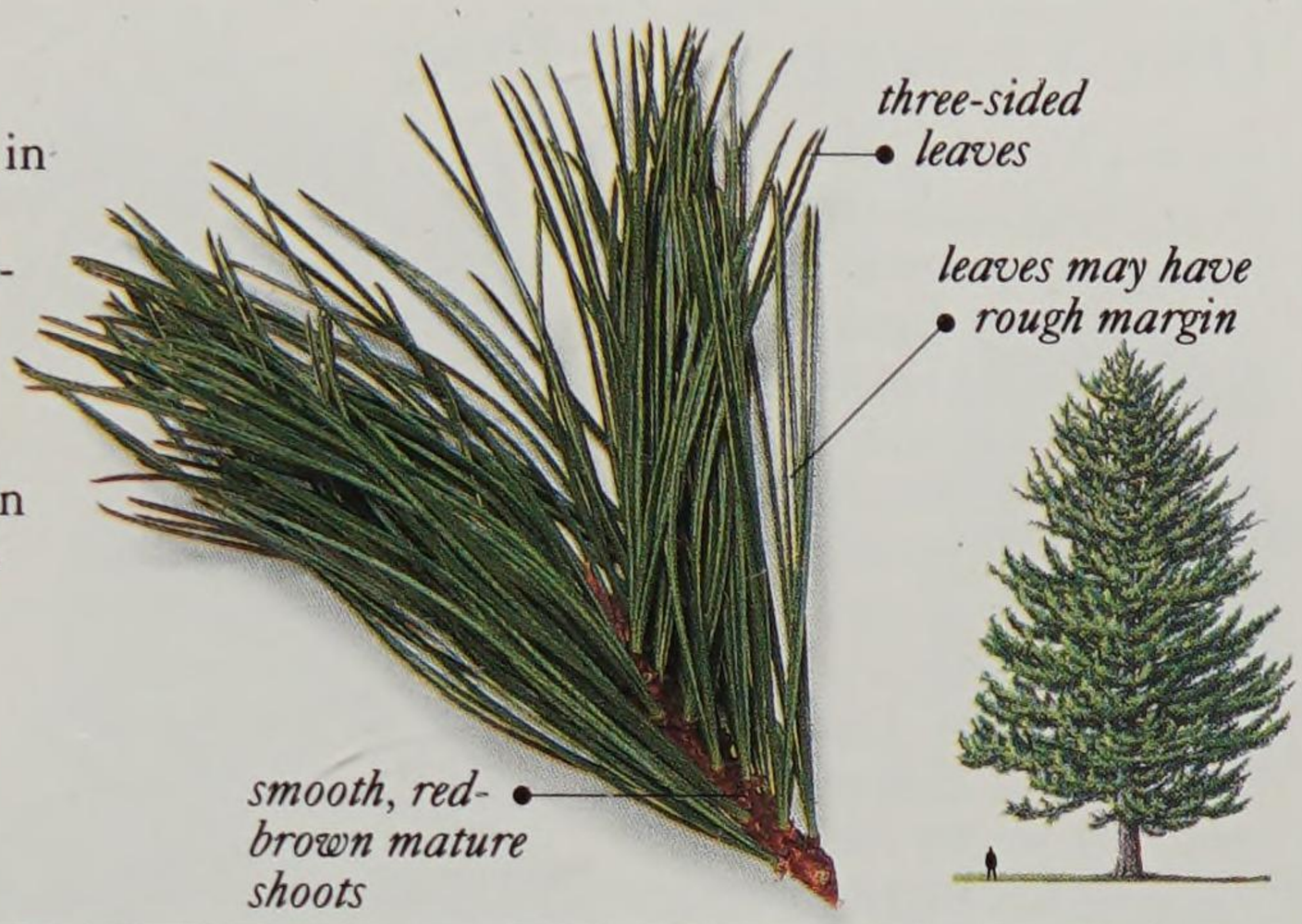
Family PINACEAE	Species *Pinus koraiensis*	Author Siebold & Zuccarini

KOREAN PINE

Leaves Needlelike and slender, to 4¾ in (12 cm) long, in dense clusters of five, glossy green on the outer surface, blue-white on the inner. ***Bark*** Dark gray, thick and flaking. ***Flowers*** Males red opening yellow, females red, borne in separate clusters on the young shoots in early summer. ***Fruit*** A conical, purple-brown cone, to 4¾ in (12 cm) long.

• **NATIVE REGION** N.E. Asia, Japan, Korea.

• **HABITAT** River valleys and low mountain slopes.



Height 115 ft (35 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus leucodermis*	Author Antoine

BOSNIAN PINE

Leaves Needlelike and rigid, to 3½ in (9 cm) long, in pairs, sharp-pointed at the tip, dark green, densely clustered and pointing forward, on bloomy shoots. ***Bark*** Gray, cracking into small, square plates. ***Flowers*** Males yellow, females purple-red, at the tips of the shoots, borne in separate clusters on the same plant in early summer. ***Fruit*** An egg-shaped cone, to 4 in (10 cm) long, deep blue at first ripening to yellow-brown in two years.

• **NATIVE REGION** Albania, Bosnia-Herzegovina/Yugoslavia, N. Greece.

• **HABITAT** Mountains, usually on limestone.

• **REMARK** Also known as *Pinus heldreichii* var. *leucodermis*. Easily distinguished by its dark green foliage, blue young cones, and narrow habit.

Height 80 ft (25 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus monophylla*	Author Torrey & Frémont

ONE-LEAVED NUT PINE

Leaves Needlelike, curved, and rigid, to 2 in (5 cm) long, tapered to a sharp point, borne singly, gray-green to blue-green, on stout, orange shoots. ***Bark*** Gray, with narrow ridges. ***Flowers*** Males yellow, females red, in separate clusters on the young shoots in early summer. ***Fruit*** A cone, to 2¼ in (5.5 cm) long, green ripening to gray-brown.

• **NATIVE REGION**
N. Mexico, S.W. United States.

• **HABITAT** Dry, rocky, mountain slopes and ridges.

• **REMARK** Also known as *P. cembroides* var. *monophylla*. Easily distinguished by its singly borne needles; most pines bear their needles in clusters of two or more.

Height 50 ft (15 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus montezumae*	Author A.B. Lambert

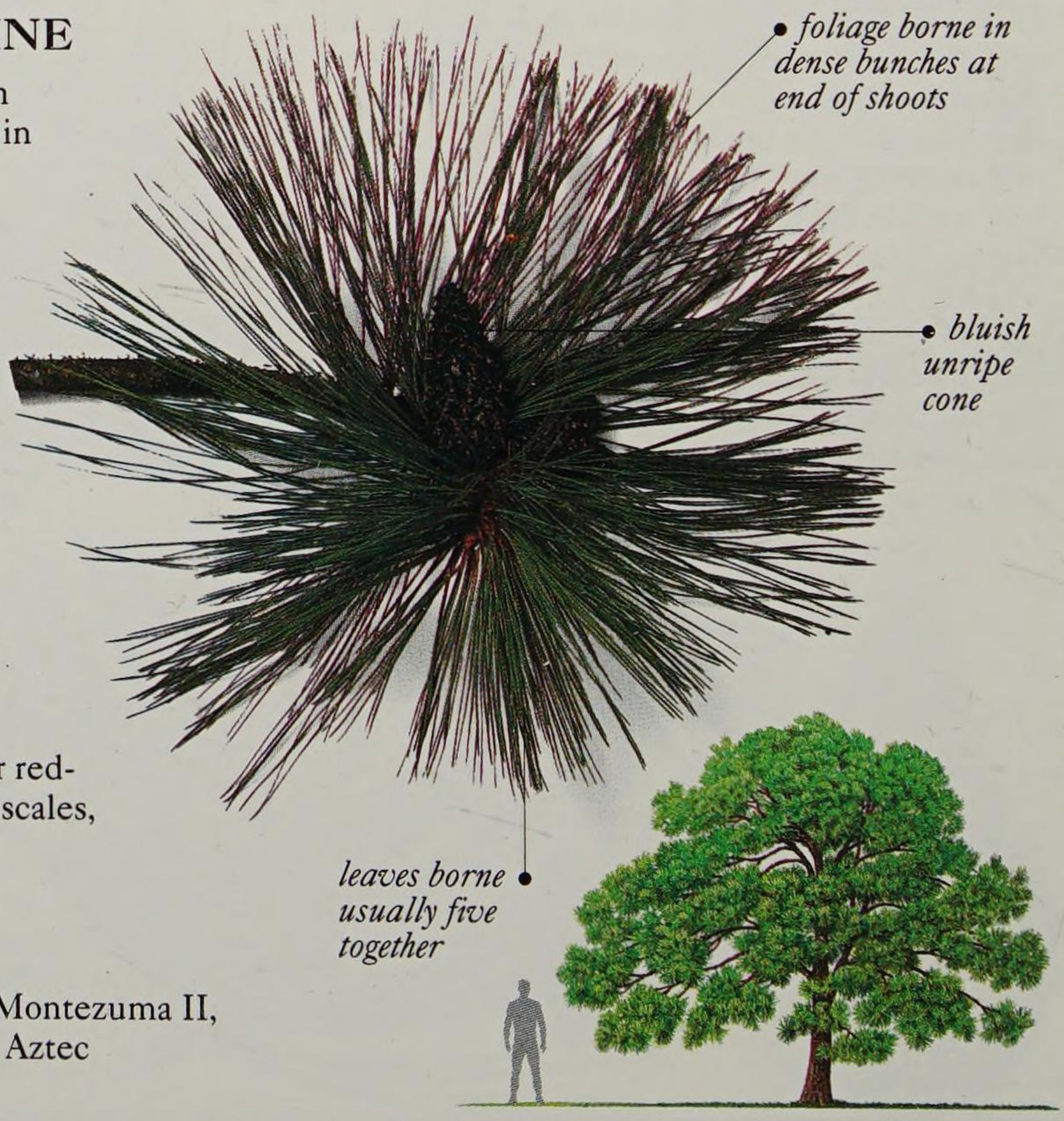
MONTEZUMA PINE

Leaves Needlelike, to 12 in (30 cm) long, borne usually in clusters of five, minutely toothed and slightly rough at the margin, gray-green, spreading in brushlike clusters, on stout, smooth, red-brown shoots. ***Bark*** Gray, thick and deeply furrowed. ***Flowers*** Males purple opening yellow, females red, in separate clusters on the young shoots in early summer. ***Fruit*** A conical to egg-shaped cone, to 6 in (15 cm) long, blue-purple ripening to yellow-brown or red-brown, with prickle-tipped scales, borne singly or in clusters.

• **NATIVE REGION**
Guatemala, Mexico.

• **HABITAT** Mountains.

• **REMARK** Named after Montezuma II, the early sixteenth-century Aztec emperor of Mexico.



Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus muricata*	Author D. Don

BISHOP PINE

Leaves Needlelike and stiff, to 6 in (15 cm) long, in pairs, gray-green or blue-green, on orange-brown shoots. ***Bark*** Purple-brown, thick, furrowed and ridged. ***Flowers*** Males yellow, females red, in separate clusters on the young shoots in early summer. ***Fruit*** An egg-shaped red-brown cone, to 3¼ in (8 cm) long, oblique at the base, borne in whorls, persisting for many years.

- **NATIVE REGION** California.
- **HABITAT** Low hills in coastal areas.

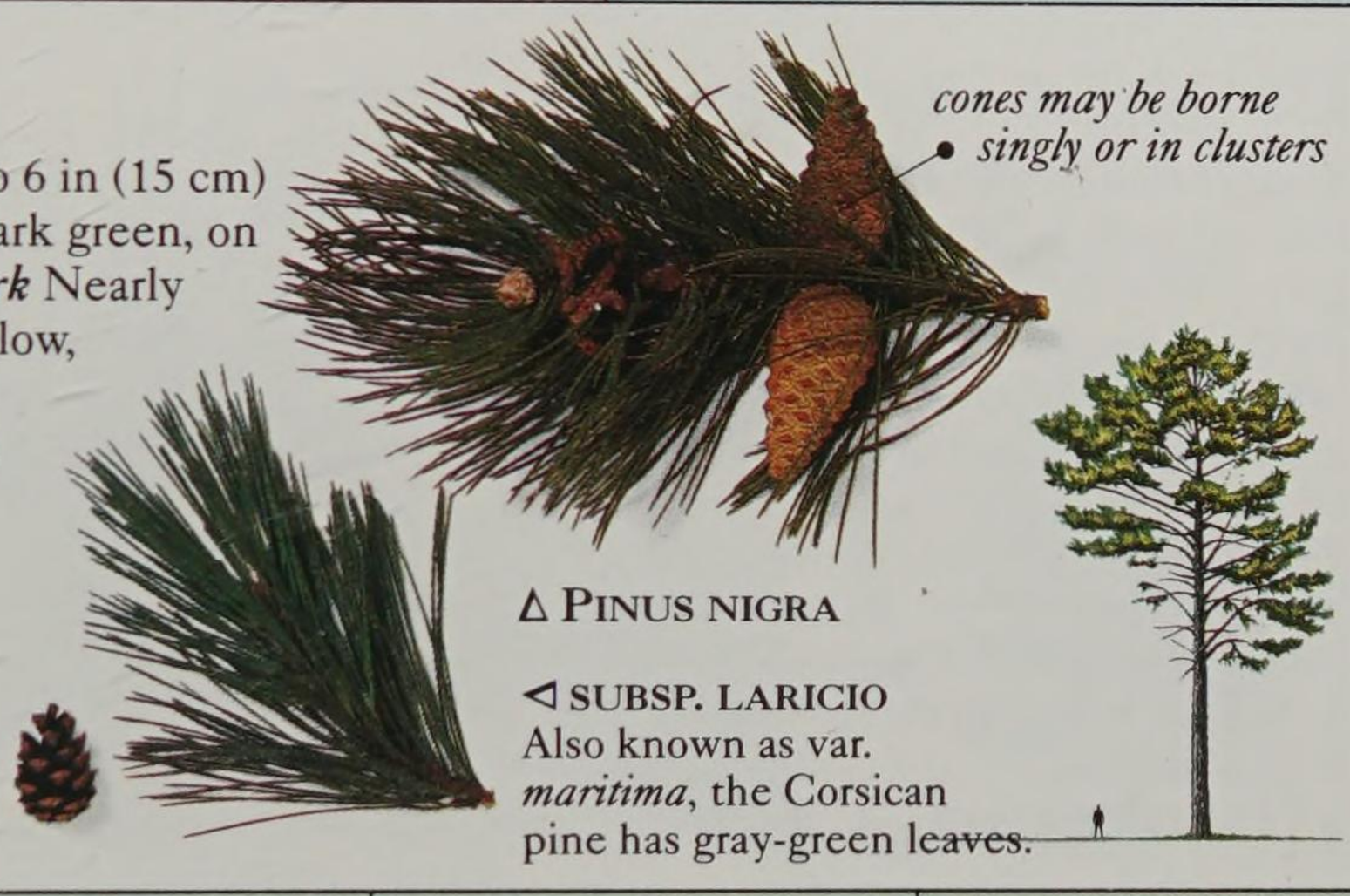
Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus nigra*	Author Arnold

AUSTRIAN PINE

Leaves Needlelike and stiff, to 6 in (15 cm) long, in pairs, sharp-pointed, dark green, on stout, glossy brown shoots. ***Bark*** Nearly black, scaly. ***Flowers*** Males yellow, females red, borne in separate clusters on the young shoots in late spring to early summer. ***Fruit*** An egg-shaped brown cone, to 3¼ in (8 cm) long.

- **NATIVE REGION** C. and S.E. Europe.
- **HABITAT** Mountains and hills, often on limestone.



△ PINUS NIGRA

◁ SUBSP. LARICIO
Also known as var. *maritima*, the Corsican pine has gray-green leaves.

Height 130 ft (40 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus parviflora*	Author Siebold & Zuccarini

JAPANESE WHITE PINE

Leaves Needlelike, slightly twisted, to 2½ in (6 cm) long, in clusters of five, the outer surface green or blue-green, the inner surface blue-white, on greenish shoots. ***Bark*** Gray, scaly, with deep fissures. ***Flowers*** Males purple-red opening yellow, females red, in separate clusters on the young shoots in early summer. ***Fruit*** An egg-shaped cone, to 2¾ in (7 cm) long, green ripening to red-brown, with leathery scales.

- **NATIVE REGION** Japan.
- **HABITAT** Mountains, on stony soil.

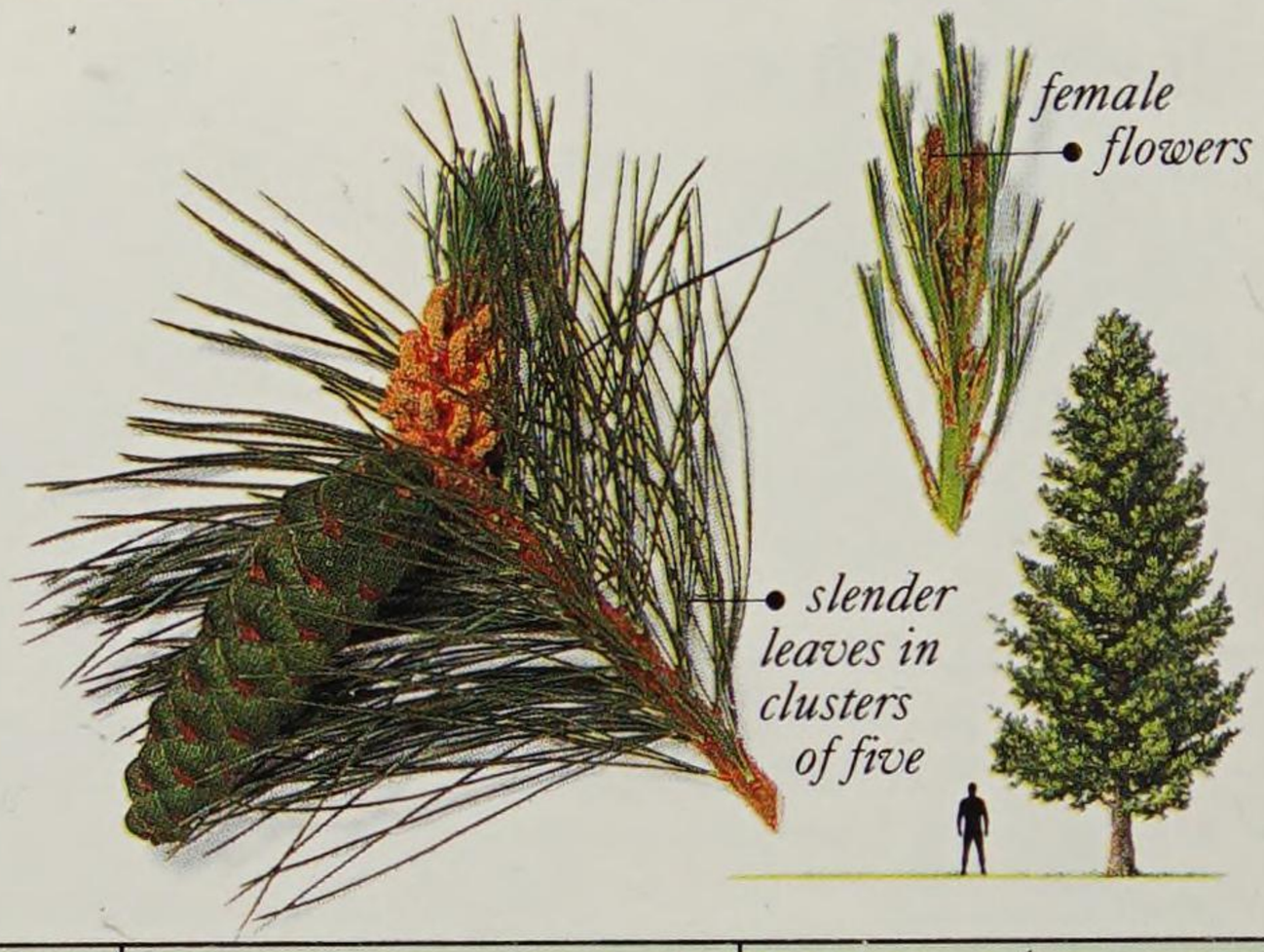
Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus peuce*	Author Grisebach

MACEDONIAN PINE

Leaves Needlelike and stiff, to 4 in (10 cm) long, in dense clusters of five, blue-green, pointing forward on smooth, bloomy, green shoots. ***Bark*** Purple-brown, fissured and cracked into plates. ***Flowers*** Males yellow, females red, in separate clusters on the young shoots in early summer. ***Fruit*** A cylindrical to conical, resinous, drooping cone, to 6 in (15 cm) long, green at first ripening to brown.

- **NATIVE REGION** S.E. Europe.
- **HABITAT** Mountains.



Height 100 ft (30 m)	Shape Narrowly columnar	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus pinaster*	Author Aiton

CLUSTER PINE

Leaves Needlelike and stiff, to 8 in (20 cm) long, in pairs, sharp-pointed, gray-green becoming dark green, on stout shoots. ***Bark*** Purple-brown and ridged, deeply fissured. ***Flowers*** Males yellow, females red, in separate clusters on the young shoots in early summer. ***Fruit*** A conical, glossy brown cone, to 8 in (20 cm) long, the scales with sharp prickles, persisting for many years.

- **NATIVE REGION** N. Africa, S.W. Europe.
- **HABITAT** Sandy soil.

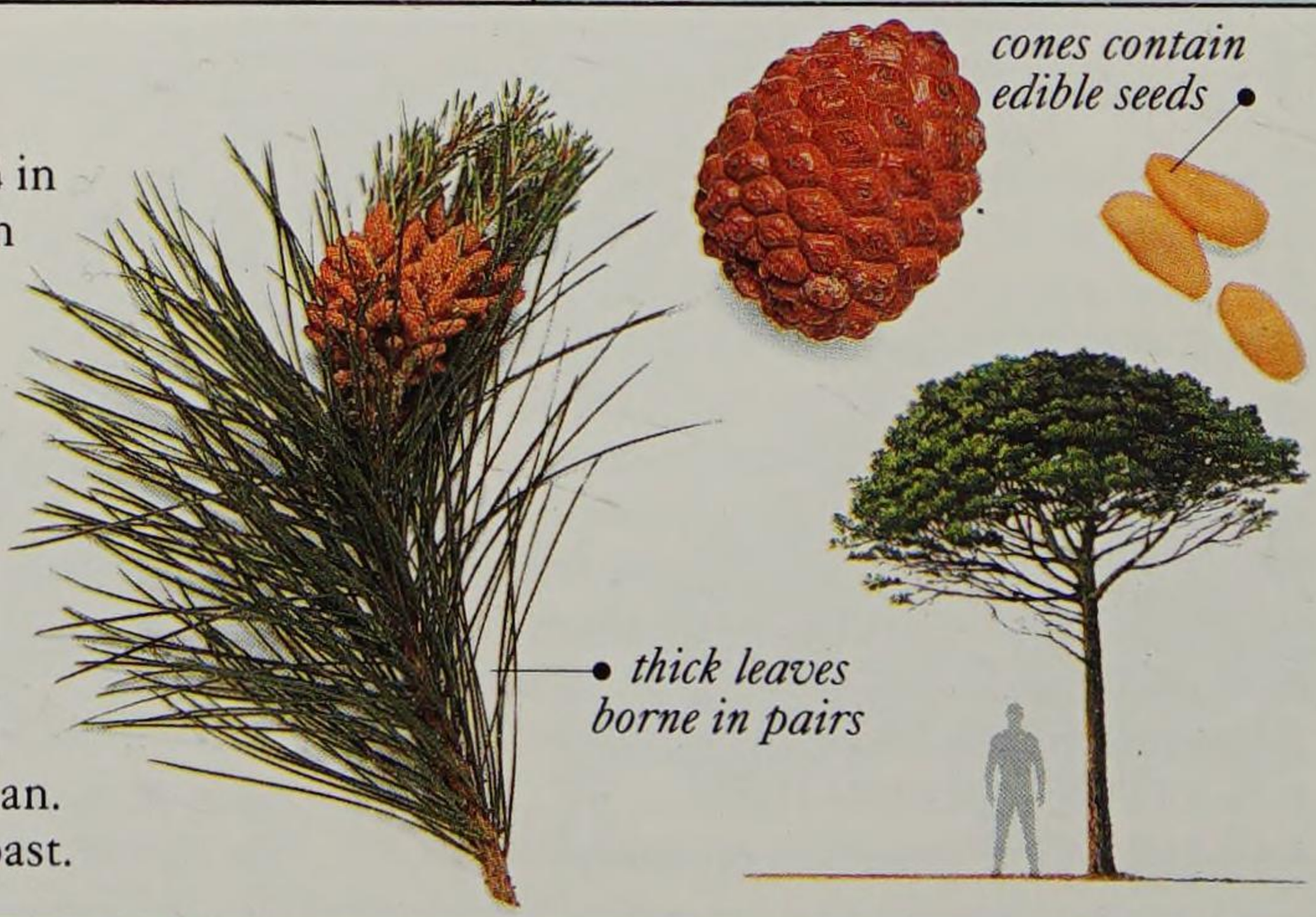
Height 115 ft (35 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus pinea*	Author Linnaeus

UMBRELLA PINE

Leaves Needlelike and stout, to 4¾ in (12 cm) long, in pairs, gray-green, on smooth, orange-brown shoots; on young plants, singly, bright blue-gray. ***Bark*** Orange-brown, deeply fissured. ***Flowers*** Males yellow, females green, borne in separate clusters on the young shoots in early summer. ***Fruit*** A nearly rounded, heavy, glossy brown cone, to 4¾ in (12 cm) long.

- **NATIVE REGION** Mediterranean.
- **HABITAT** Sandy soil near the coast.



Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

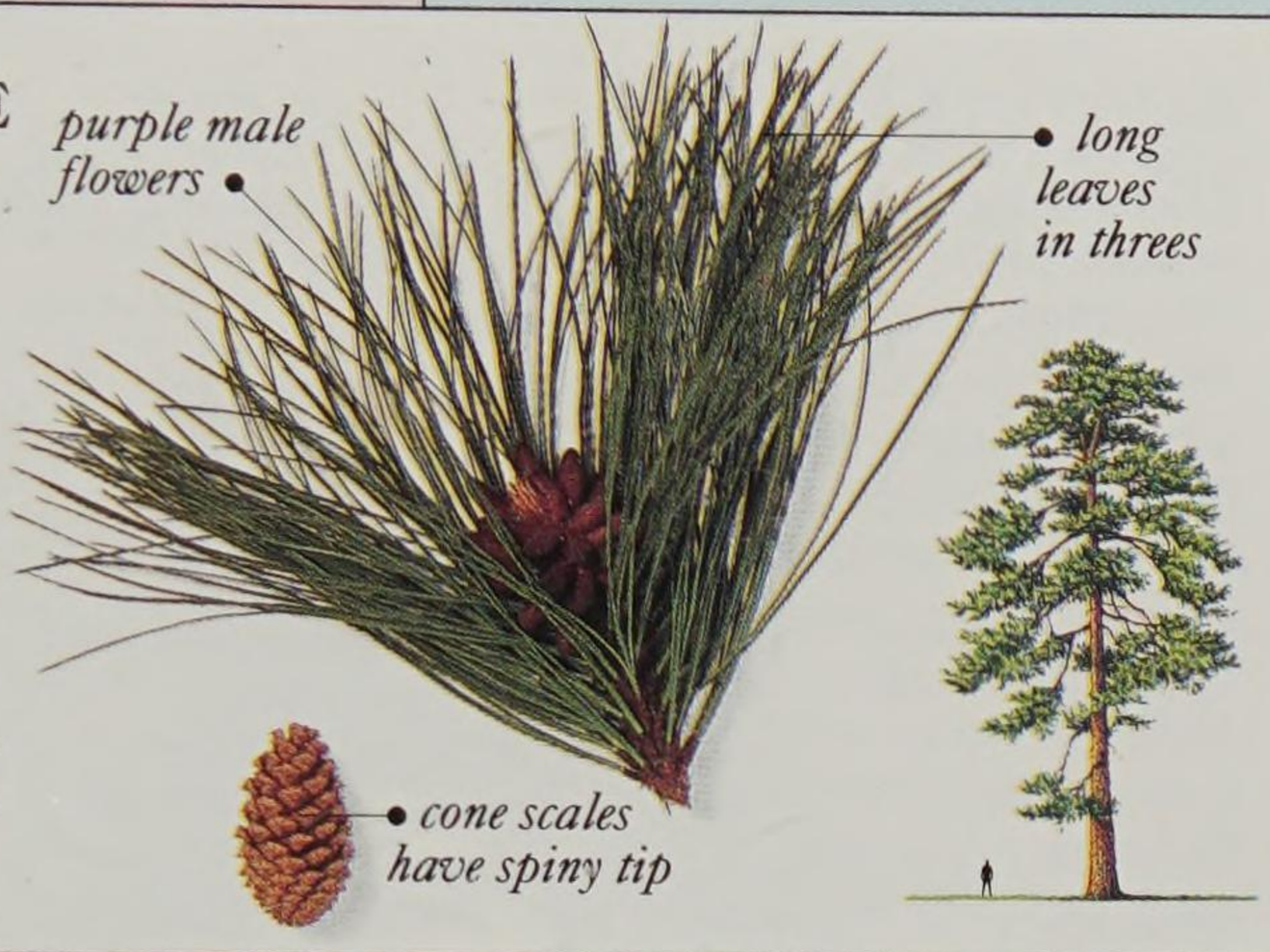
Family PINACEAE	Species *Pinus ponderosa*	Author Lawson

WESTERN YELLOW PINE

Leaves Needlelike and rigid, to 10 in (25 cm) long, in clusters of three, dark gray-green, pointing forward, on stout, smooth, yellow- to red-brown shoots. ***Bark*** Yellow-brown or reddish, thick, in large plates. ***Flowers*** Males deep purple, females red, borne in separate clusters on the young shoots in late spring. *Fruit* An egg-shaped cone, to 4 in (10 cm) or more long, purple ripening to glossy red-brown.

• **NATIVE REGION** W. North America.

• **HABITAT** Mountain slopes.



Height 164 ft (50 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

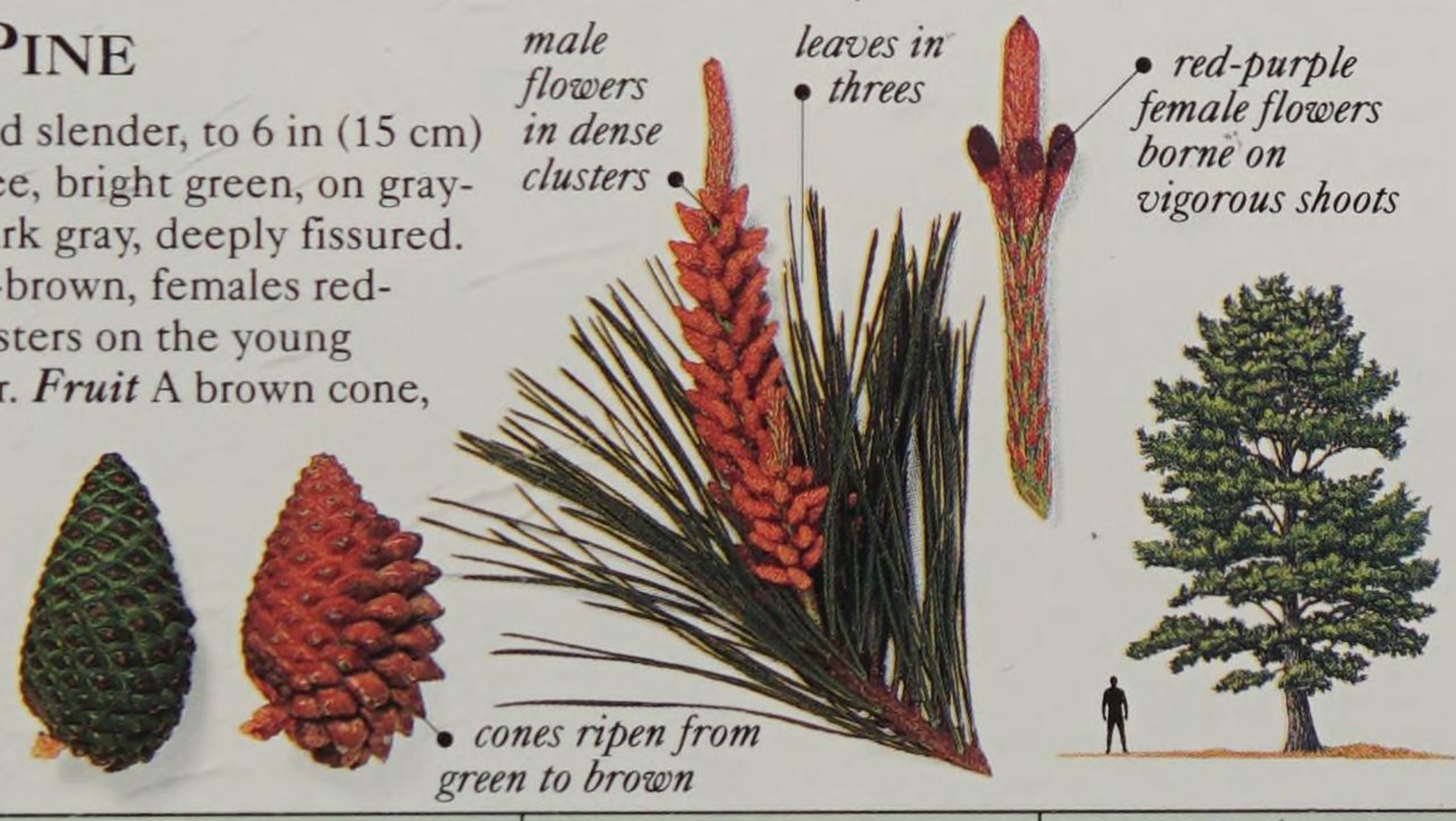
Family PINACEAE	Species *Pinus radiata*	Author D. Don

MONTEREY PINE

Leaves Needlelike and slender, to 6 in (15 cm) long, in clusters of three, bright green, on gray-green shoots. ***Bark*** Dark gray, deeply fissured. ***Flowers*** Males yellow-brown, females red-purple, in separate clusters on the young shoots in early summer. *Fruit* A brown cone, to 4¾ in (12 cm) long, persisting for years.

• **NATIVE REGION** California.

• **HABITAT** Dry slopes near coast.



Height 100 ft (30 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

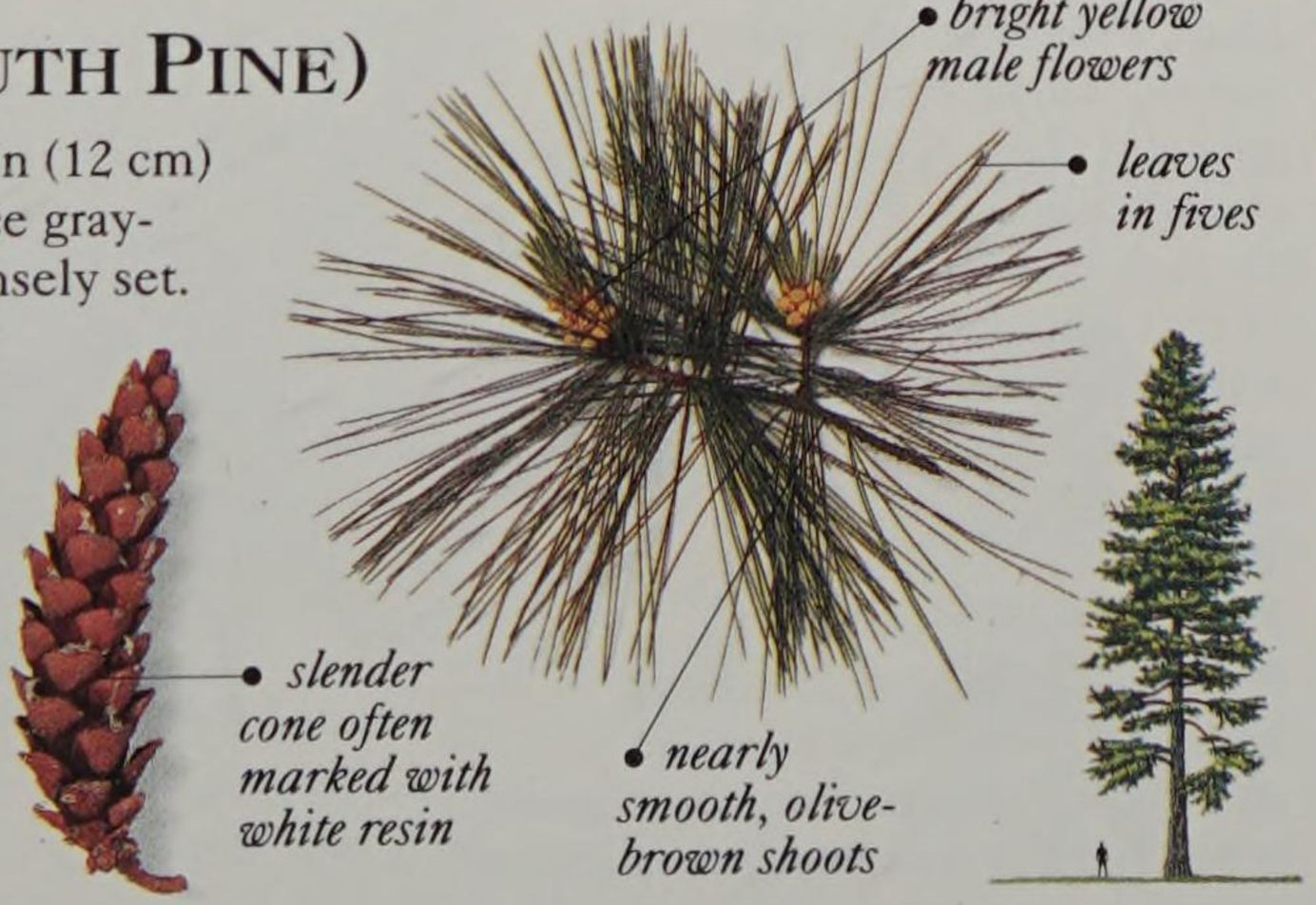
Family PINACEAE	Species *Pinus strobus*	Author Linnaeus

WHITE PINE (WEYMOUTH PINE)

Leaves Needlelike and slender, to 4¾ in (12 cm) long, in clusters of five, the outer surface gray-green, the inner surface gray-white, densely set. ***Bark*** Dark gray and smooth, becoming deeply fissured. ***Flowers*** Males yellow, females pink, in separate clusters on the young shoots in early summer. *Fruit* A cylindrical, curved, hanging cone, to 6 in (15 cm) or more long, green ripening to pale brown.

• **NATIVE REGION** E. North America.

• **HABITAT** Woods at low altitudes.



Height 164 ft (50 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus sylvestris*	Author Linnaeus

SCOTCH PINE

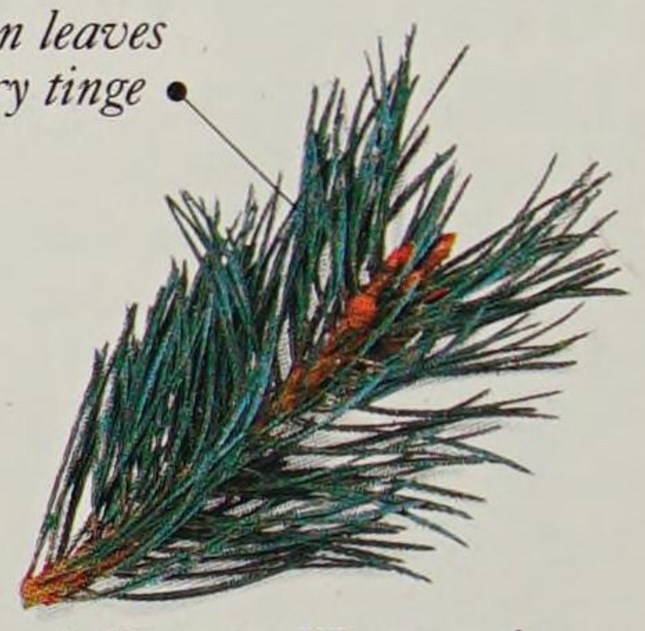
Leaves Needlelike, stout, and twisted, to 2¾ in (7 cm) long, in pairs, blue-green to blue-gray. ***Bark*** Purple-gray, peeling in irregular plates; orange and flaking toward the top of the plant. ***Flowers*** Males yellow, females red, in separate clusters on the young shoots in late spring to early summer. ***Fruit*** An egg-shaped cone, to 3 in (7.5 cm) long, green ripening to brown.

• **NATIVE REGION** Asia, Europe.

• **HABITAT** Mountains, on sandy or gravelly soil.

• **REMARK** This species makes a broadly spreading tree in open situations, but is narrow in confined places.

∇ **PINUS SYLVESTRIS**



Δ **'EDWIN HILLIER'** This form is selected for its striking foliage and rust-colored bark.

Height 115 ft (35 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus tabuliformis*	Author Carrière

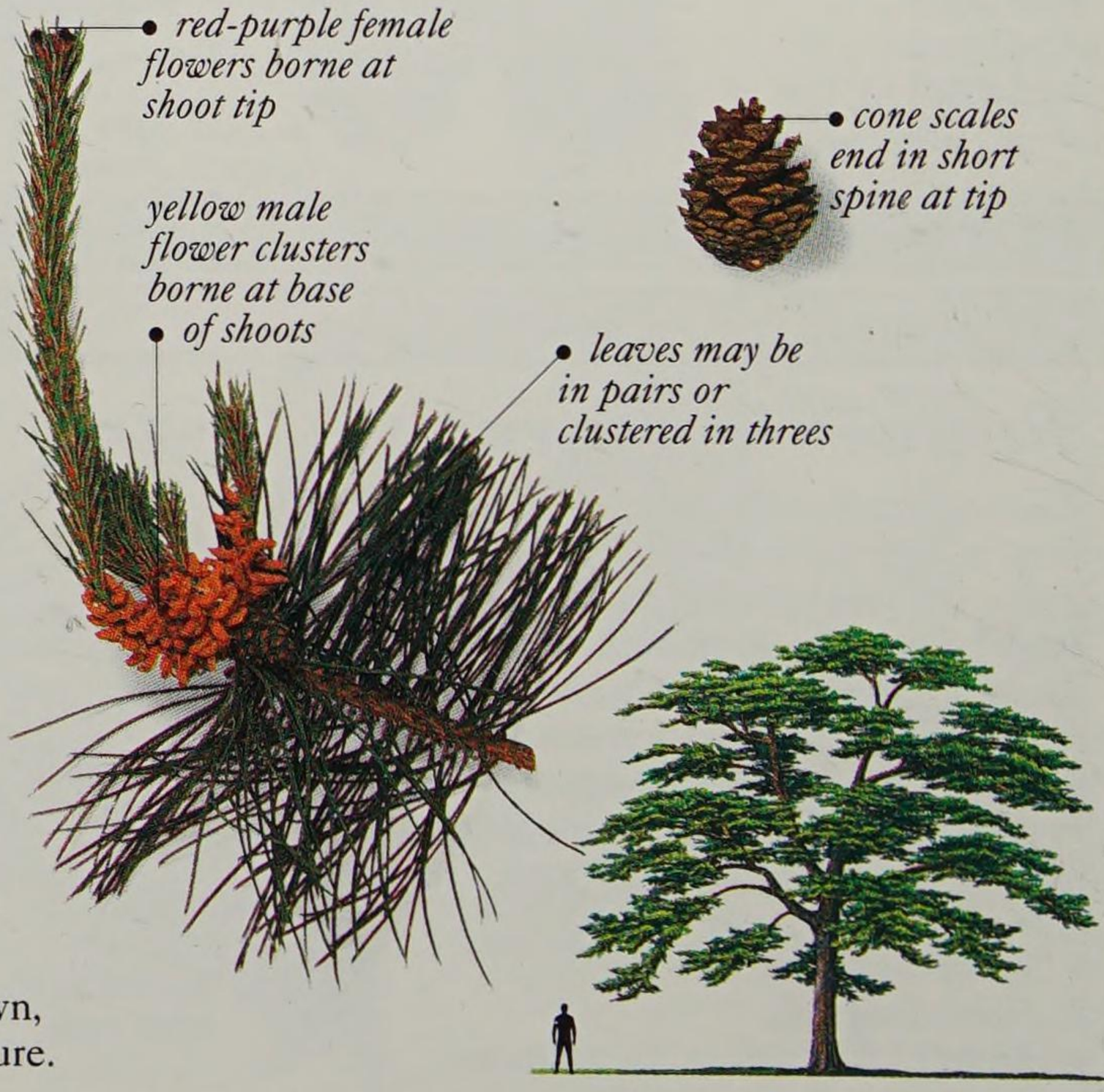
CHINESE PINE

Leaves Needlelike, to 6 in (15 cm) long, usually in pairs but sometimes in clusters of three, green to gray-green, on yellow-brown shoots; young shoots bloomy. ***Bark*** Gray and fissured; tinged with orange or pink toward the top of the plant. ***Flowers*** Males pale yellow, females red-purple, in separate clusters on the shoots in early summer. ***Fruit*** An egg-shaped, brown cone, to 2½ in (6 cm) long, the scales each with a small spine at the tip, long-persistent on the shoots.

• **NATIVE REGION** W., C., and N. China.

• **HABITAT** Mountains.

• **REMARK** Young plants are usually more conical in shape, developing the flat, spreading crown, typical of this species, as they mature.



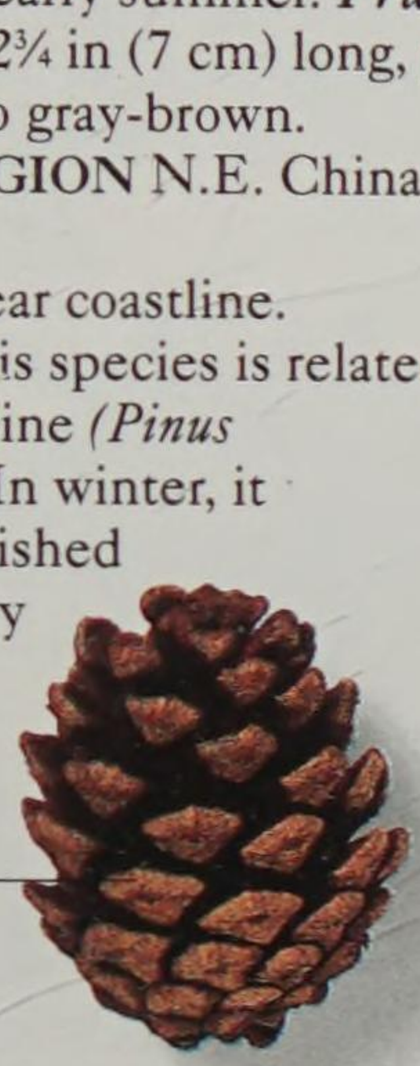
Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

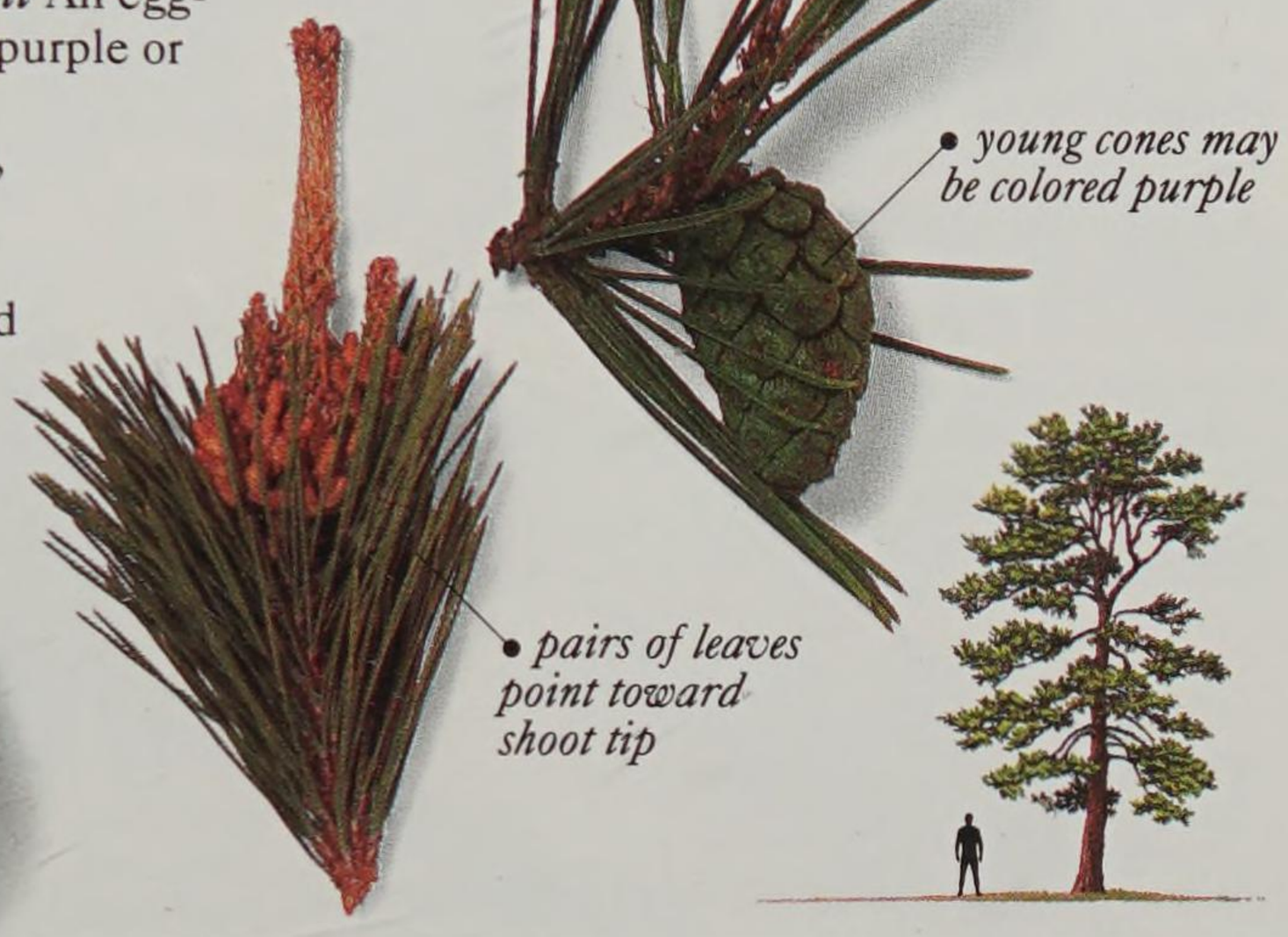
Family PINACEAE	Species *Pinus thunbergii*	Author Parlatore

JAPANESE BLACK PINE

Leaves Needlelike and rigid, to 4 in (10 cm) long, in pairs, sharp-pointed, densely set, pointing forward, on smooth, yellow-brown shoots. ***Bark*** Gray, cracking into irregular plates. ***Flowers*** Males yellowish, females purple-red, in separate clusters on the young shoots in early summer. ***Fruit*** An egg-shaped cone, to 2¾ in (7 cm) long, purple or green ripening to gray-brown.

- **NATIVE REGION** N.E. China, Japan, Korea.
- **HABITAT** Near coastline.
- **REMARK** This species is related to the Austrian pine *(Pinus nigra*, see p.71). In winter, it is easily distinguished by its white, hairy leaf buds.





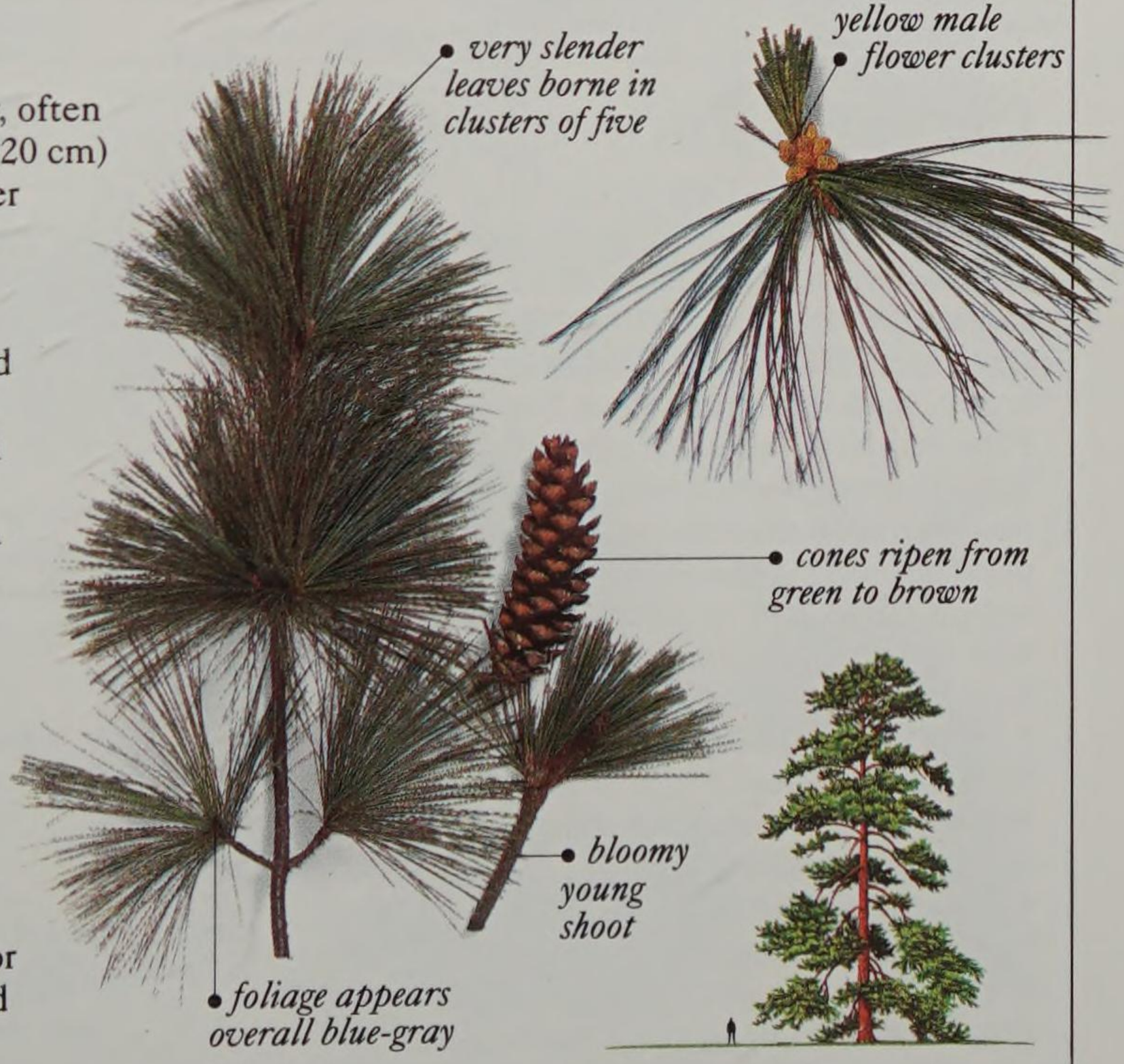
Height 100 ft (30 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pinus wallichiana*	Author Jackson

HIMALAYAN PINE

Leaves Needlelike and slender, often kinked at first, flexible, to 8 in (20 cm) long, in clusters of five, the outer surface green, the inner surface blue-white, on smooth, green, bloomy shoots. ***Bark*** Gray and smooth, becoming dark gray and fissured. ***Flowers*** Males yellow, females blue-green and pink, in separate clusters on the young shoots in early summer. ***Fruit*** A curved, resinous, hanging cone, to 12 in (30 cm) long, green ripening to pale brown.

- **NATIVE REGION** The Himalayas.
- **HABITAT** Mountain forests.
- **REMARK** Also known as Bhutan pine, blue pine. The first name should be reserved for *P. bhutanica*, a recently described species from Bhutan, S. Asia.



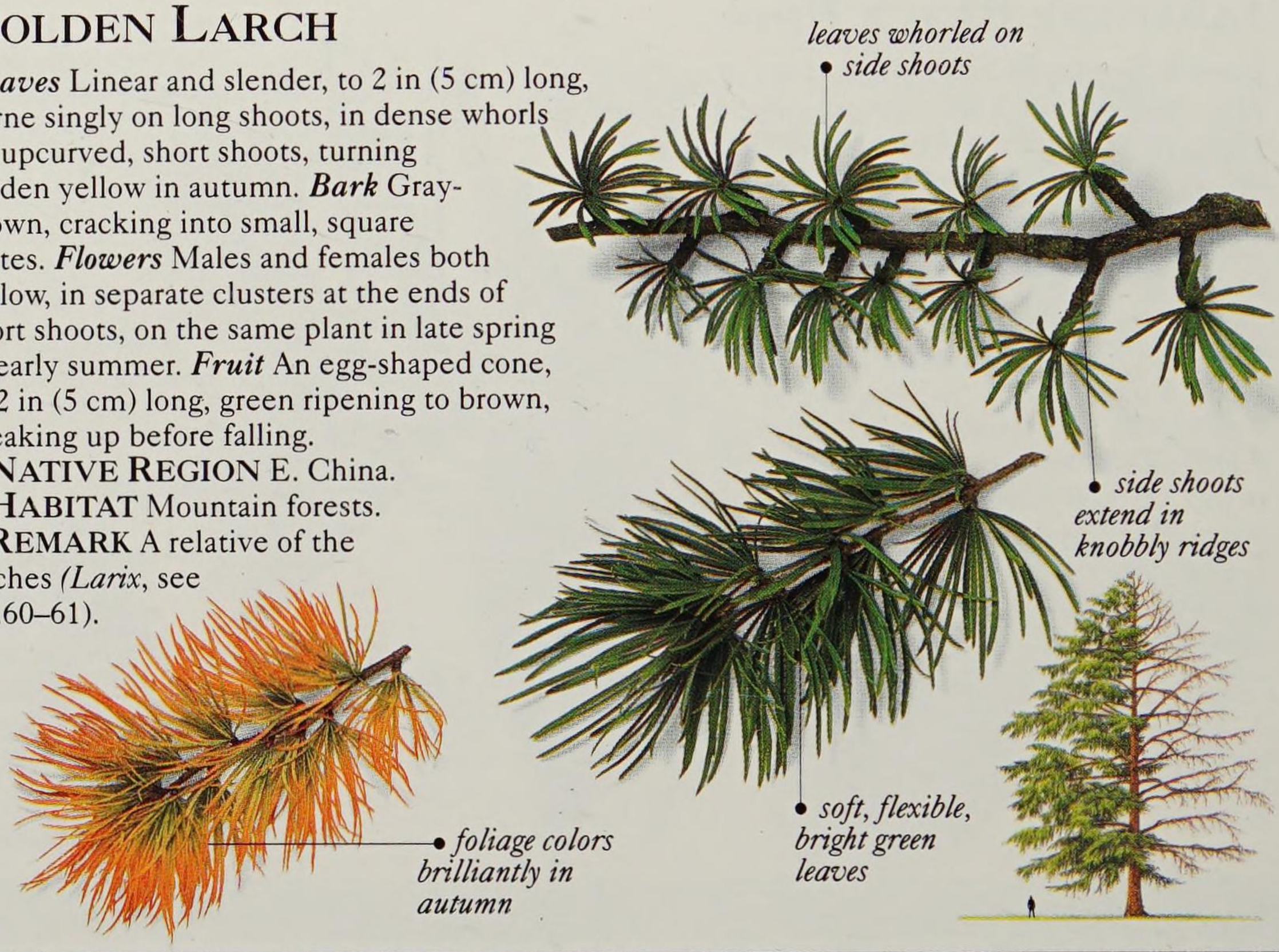
Height 130 ft (40 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Pseudolarix amabilis*	Author (Nelson) Rehder

GOLDEN LARCH

Leaves Linear and slender, to 2 in (5 cm) long, borne singly on long shoots, in dense whorls on upcurved, short shoots, turning golden yellow in autumn. ***Bark*** Gray-brown, cracking into small, square plates. ***Flowers*** Males and females both yellow, in separate clusters at the ends of short shoots, on the same plant in late spring or early summer. ***Fruit*** An egg-shaped cone, to 2 in (5 cm) long, green ripening to brown, breaking up before falling.

- **NATIVE REGION** E. China.
- **HABITAT** Mountain forests.
- **REMARK** A relative of the larches *(Larix*, see pp.60–61).



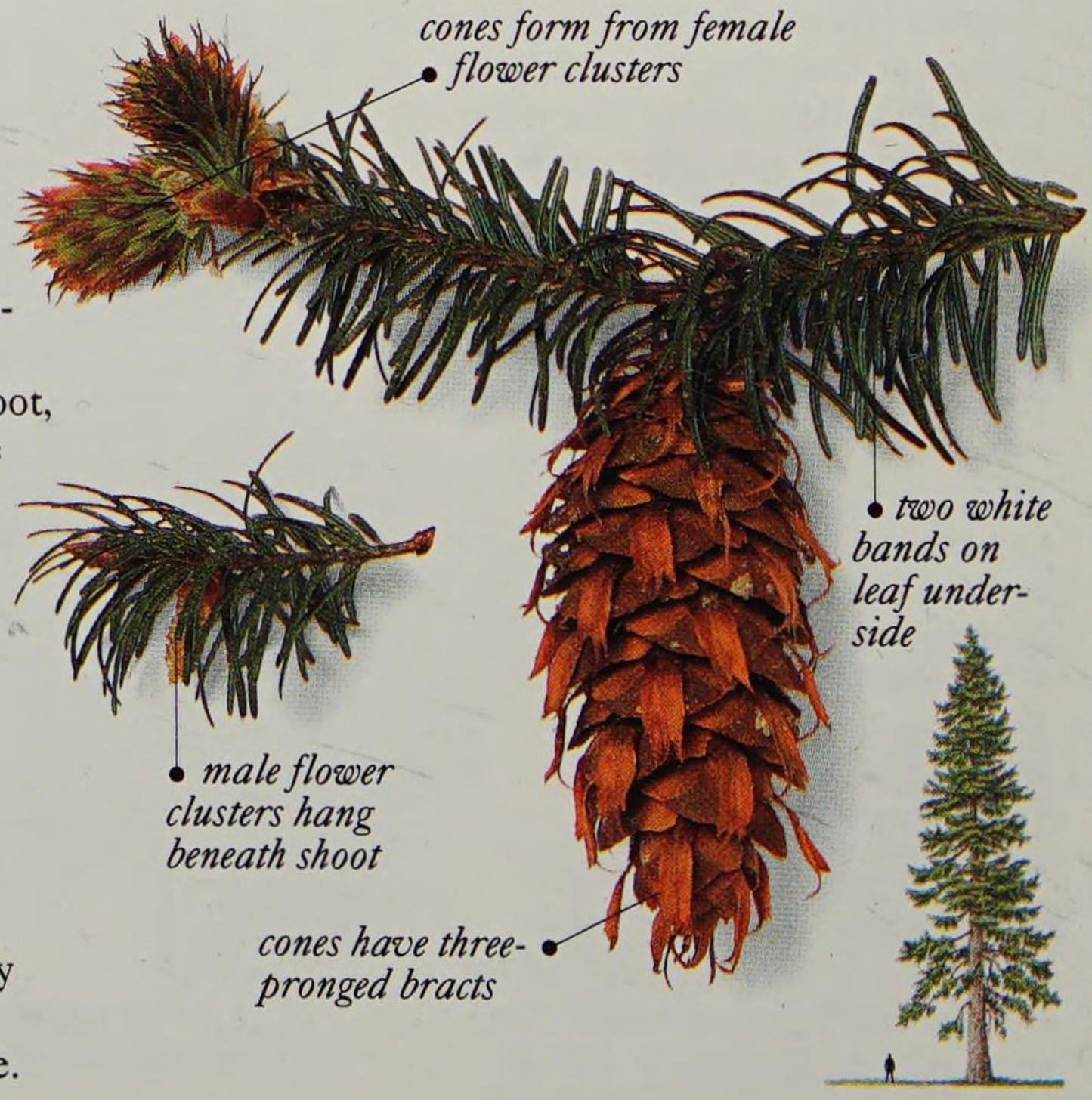
Height 130 ft (40 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family PINACEAE	Species *Pseudotsuga menziesii*	Author (Mirbel) Franco

DOUGLAS FIR

Leaves Linear, to 1¼ in (3 cm) long, rounded and blunt at tip, green above, with two white bands beneath, aromatic, arranged all around the shoot or spreading above. ***Bark*** Purple-brown, thick, with red-brown fissures. ***Flowers*** Males yellow, beneath the shoot, females green flushed with pink at the tip, in separate clusters on the same plant in spring. ***Fruit*** A red-brown, hanging cone, to 4 in (10 cm) long, with three-pointed bracts projecting from between the scales.

- **NATIVE REGION** W. North America.
- **HABITAT** Evergreen forests on moist mountain slopes.
- **REMARK** The common name commemorates the nineteenth-century Scottish plant hunter David Douglas. Also known as Oregon fir, Oregon pine.



Height 200 ft (60 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Tsuga canadensis*	Author (Linnaeus) Carrière

EASTERN HEMLOCK

Leaves Linear, to ½ in (1.2 cm) long, dark green above, with two white bands beneath.
Bark Purple-gray, with scaly ridges.
Flowers Males yellow, beneath the shoot, females resembling small, green cones, at the tip, in separate clusters in late spring.
Fruit An egg-shaped, pale brown, hanging cone, to ¾ in (2 cm) long.

• **NATIVE REGION**
E. North America.
• **HABITAT** Hilly or rocky woods.

Height 100 ft (30 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Tsuga caroliniana*	Author Engelmann

CAROLINA HEMLOCK

Leaves Linear, to ¾ in (2 cm) long, dark green above, with two white bands beneath. ***Bark*** Red-brown, furrowed and ridged with age. ***Flowers*** Males and females both reddish, males below the shoot, females at the tip, borne in separate clusters in late spring.
Fruit An egg-shaped, pale brown, hanging cone, 1 in (2.5 cm) long.

• **NATIVE REGION**
S.E. United States.
• **HABITAT** Mountain slopes.

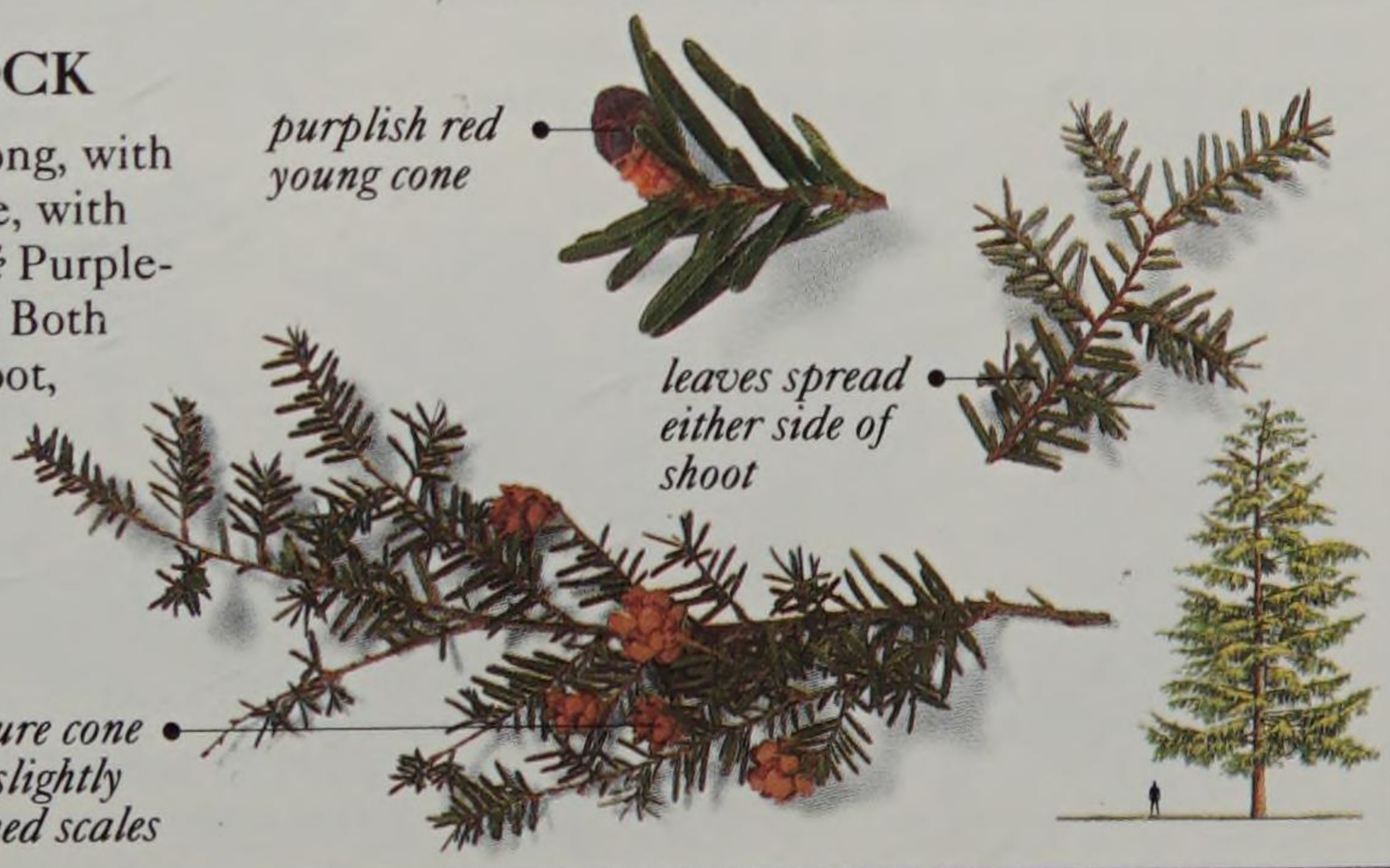
Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PINACEAE	Species *Tsuga heterophylla*	Author (Rafinesque) Sargent

WESTERN HEMLOCK

Leaves Linear, to ¾ in (2 cm) long, with parallel sides, dark green above, with two white bands beneath. *Bark* Purple-brown, ridged, flaking. *Flowers* Both reddish, males beneath the shoot, females at the tip, in separate clusters on the same plant in spring. ***Fruit*** An egg-shaped, brown, hanging cone, ¾ in (2 cm) long.

• **NATIVE REGION**
W. North America.
• **HABITAT** Forests.



Height 200 ft (60 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

PODOCARPACEAE

OVER 100 SPECIES OF evergreen trees and shrubs, mainly in the genus *Podocarpus*, belong to this family; most grow in warm regions of the southern hemisphere. Male and female flowers are usually on separate plants, the males in catkinlike clusters. Females develop into a fleshy cone or seed.

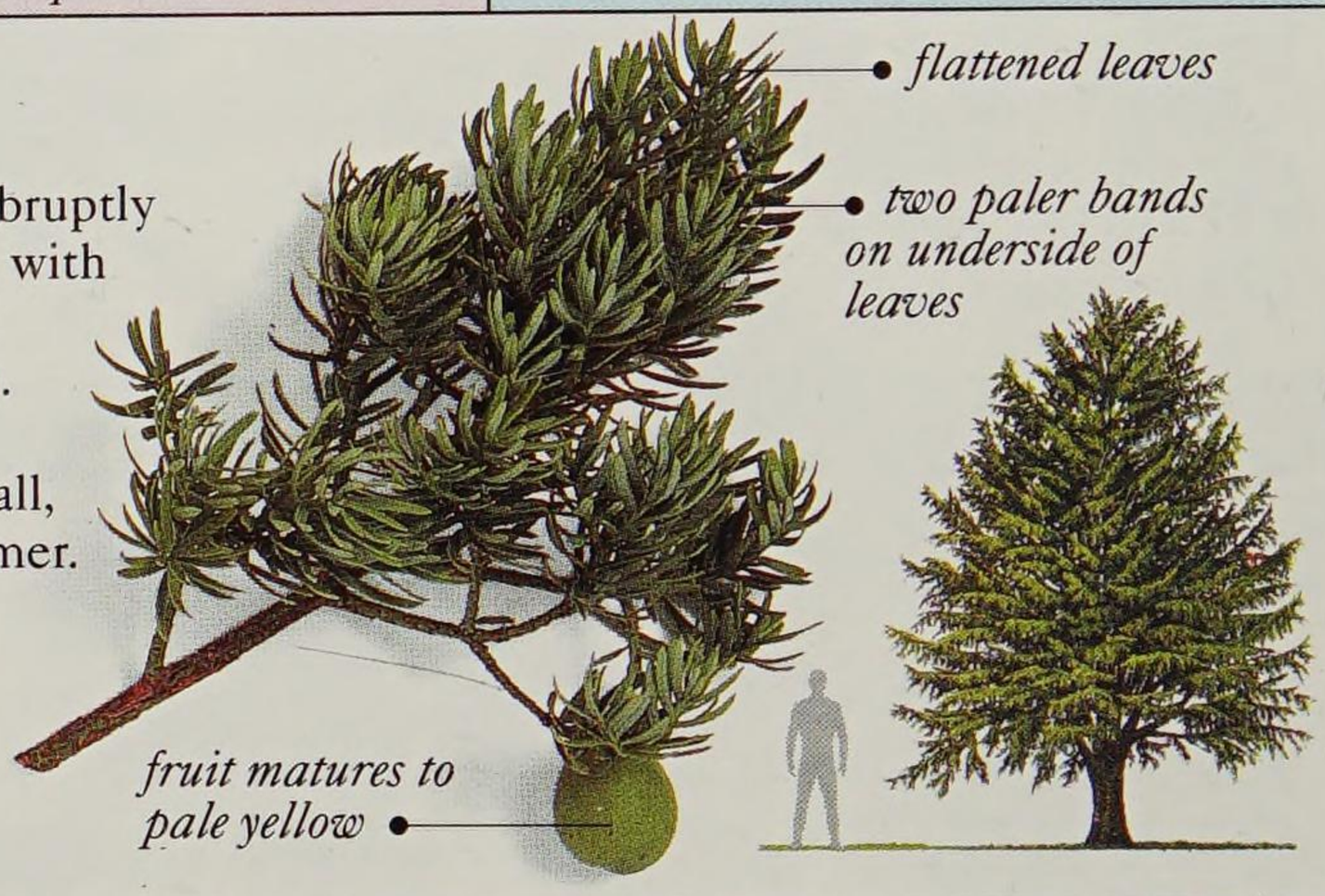
Family PODOCARPACEAE	Species *Podocarpus andinus*	Author Endlicher

PLUM-FRUITED FIR

Leaves Linear, to 1 in (2.5 cm) long, abruptly short-pointed, deep blue-green above, with two whitish bands beneath, all around the shoot. ***Bark*** Dark gray and smooth. ***Flowers*** Males yellow, in branched clusters 1 in (2.5 cm) long, females small, green, on separate plants in early summer. ***Fruit*** Fleshy, plumlike, edible, green ripening to yellow, with a single seed.

• **NATIVE REGION**
Argentina, S. Chile.

• **HABITAT** Mountains.



Height 50 ft (15 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family PODOCARPACEAE	Species *Saxegothaea conspicua*	Author Lindley

PRINCE ALBERT'S YEW

Leaves Linear, usually curved, to 1¼ in (3 cm) long, with a fine, sharp point at the tip, dark green above, with two whitish bands beneath, loosely arranged in two ranks either side of the shoot or spreading all around it. ***Bark*** Purple-brown, smooth, peeling in strips. ***Flowers*** Males purplish in the leaf axils beneath the shoot, females blue-green, at the tip of the shoot, in separate clusters on the same plant in late spring to early summer. ***Fruit*** A rounded, fleshy cone, to ¾ in (2 cm) across, with prickly, blue-green scales.

• **NATIVE REGION** Chile.

• **HABITAT** Forests.

Height 40 ft (12 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

TAXACEAE

THIS FAMILY IS OFTEN classed apart from the true conifers because its members do not bear their seeds in cones. The six genera contain about 18 species of evergreen trees and shrubs. Male and female flowers are usually on separate plants. Females mature to a single seed surrounded by a fleshy aril.

Family TAXACEAE	Species *Taxus baccata*	Author Linnaeus

COMMON YEW

Leaves Linear, to 1¼ in (3 cm) long, pointed, dark green above, with two paler green bands beneath, mainly spreading in two ranks either side of the shoot. ***Bark*** Purple-brown, smooth and flaking. ***Flowers*** Males and females both small, males pale yellow, in clusters in the leaf axils, beneath the shoot, females singly, at the end of the young shoots, on separate plants in spring. ***Fruit*** A single seed, enclosed in a fleshy, usually red, aril, the whole ⅜ in (1 cm) long, open at the top, exposing the green seed.

- **NATIVE REGION** N. Africa, S.W. Asia, Europe.
- **HABITAT** Lime-rich soil.
- **REMARK** All parts are poisonous except the aril.

△ TAXUS BACCATA

'LUTEA' ▷
The yellow-berried yew is named for the color of its fruits.

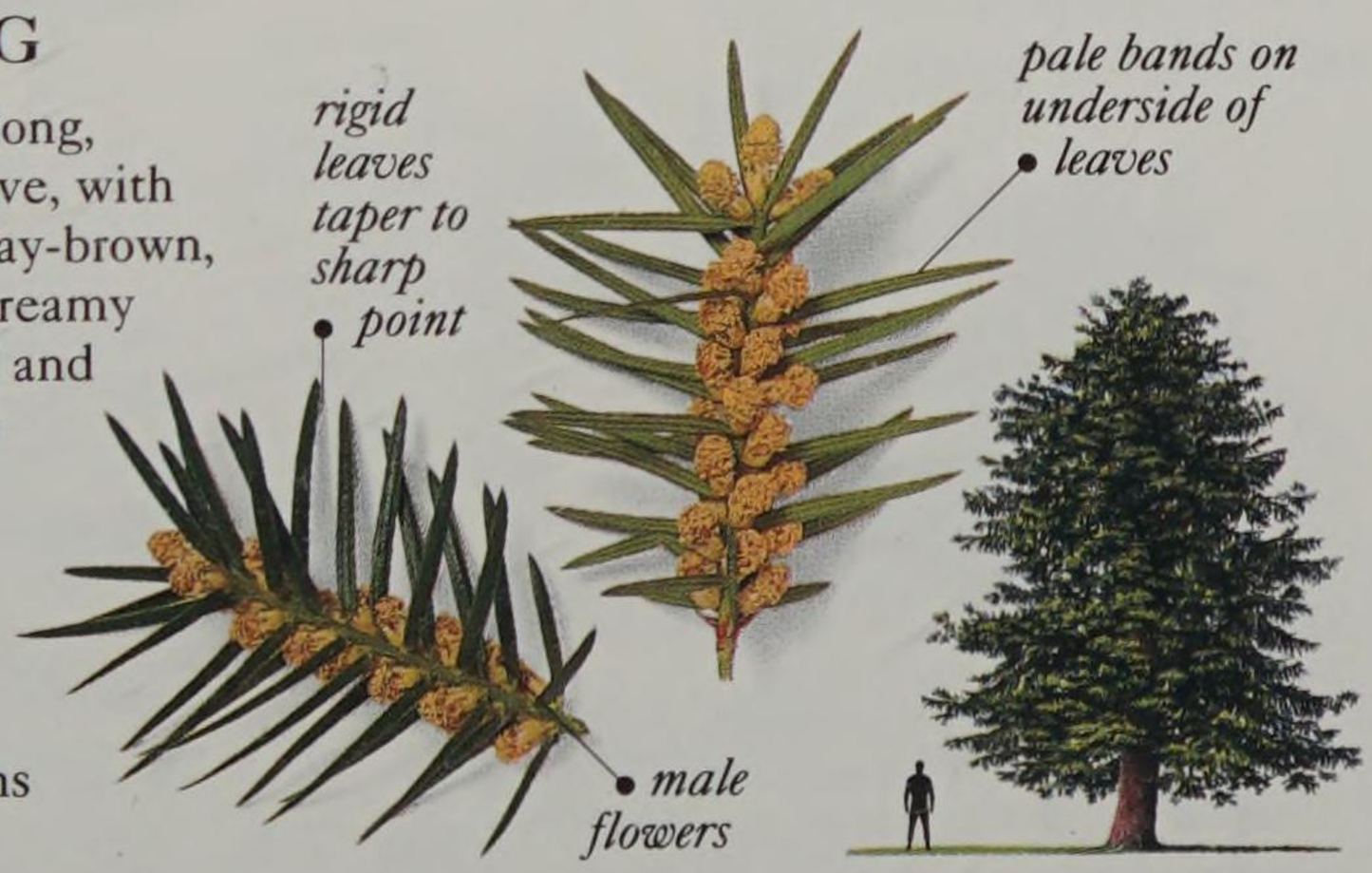
Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family TAXACEAE	Species *Torreya californica*	Author Torrey

CALIFORNIA NUTMEG

Leaves Needlelike, to 2½ in (6 cm) long, sharp-pointed, glossy dark green above, with two whitish bands beneath. ***Bark*** Gray-brown, with vertical ridges. ***Flowers*** Males creamy white, in the leaf axils, females small and green, on separate plants in spring to early summer. ***Fruit*** A single large seed, enclosed in a green, purple-flushed aril, the whole about 1½ in (4 cm) long.

- **NATIVE REGION** California.
- **HABITAT** Cool slopes and canyons in coastal regions and mountains.



Height 100 ft (30 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

TAXODIACEAE

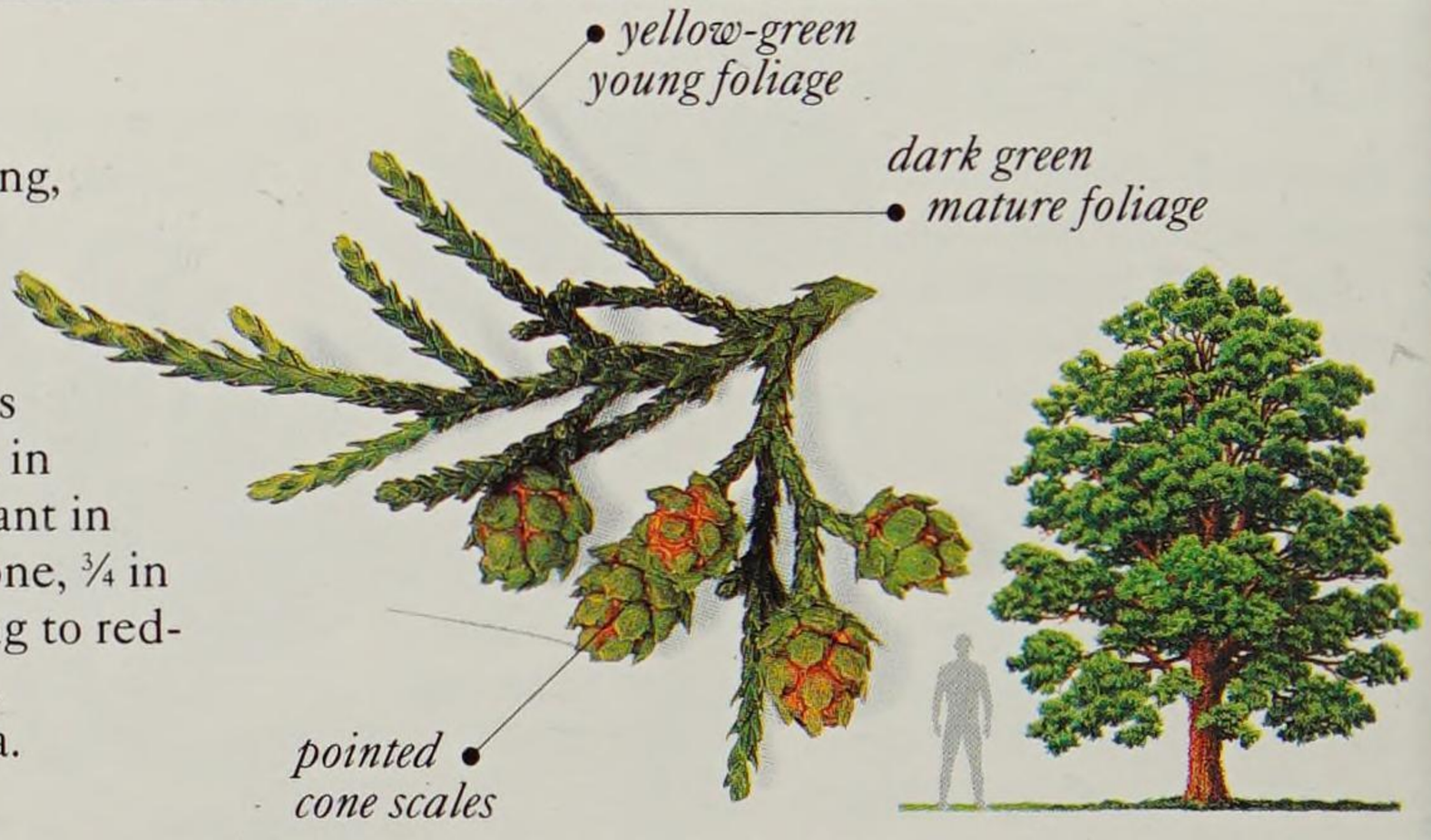
THE SWAMP CYPRESS family contains about ten genera and 15 species of deciduous and evergreen trees, found in North America, east Asia, and Tasmania. The leaves may be needle- or scalelike. Male and female flowers are borne separately on the same plant; females develop into woody cones.

Family TAXODIACEAE	Species *Athrotaxis laxifolia*	Author W.J. Hooker

SUMMIT CEDAR

Leaves Small, to ¼ in (6 mm) long, with sharp, free, spreading tips, yellowish becoming dark green. ***Bark*** Red-brown, peeling vertically. ***Flowers*** Males and females both yellow-brown, in separate clusters on the same plant in early spring. ***Fruit*** A rounded cone, ¾ in (2 cm) across, pale green ripening to red-brown, with spine-tipped scales.

- **NATIVE REGION** Tasmania.
- **HABITAT** Mountains.



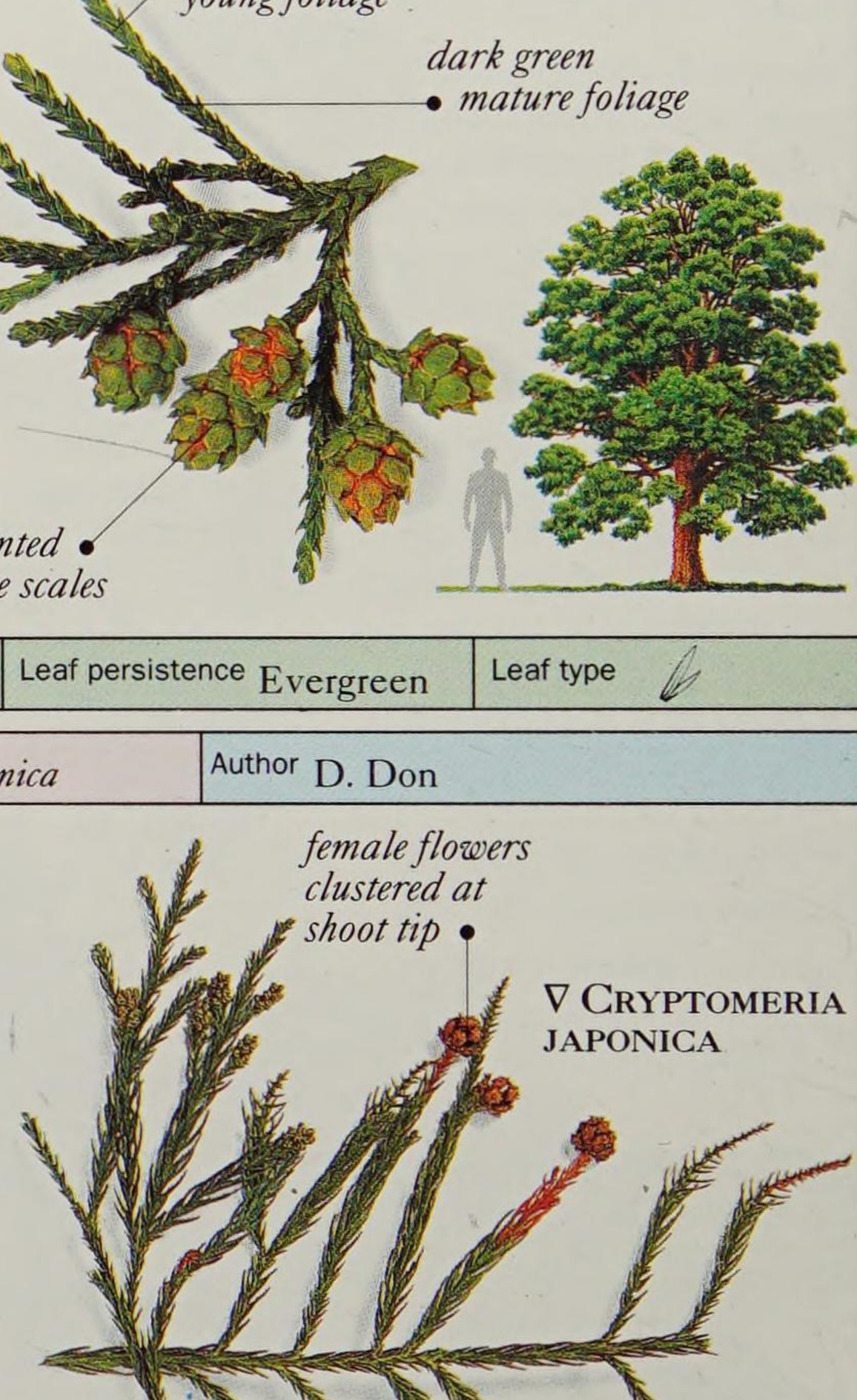
Height 33 ft (10 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family TAXODIACEAE	Species *Cryptomeria japonica*	Author D. Don

JAPANESE CEDAR

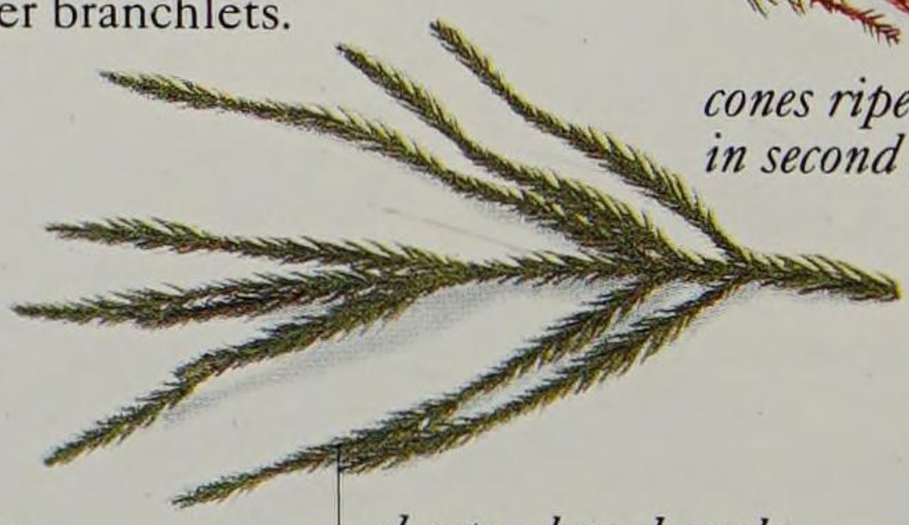
Leaves Slender, to ⅝ in (1.5 cm) long, flattened at the base, taper-pointed at the tip, bright green, curved forward along the shoots. ***Bark*** Orange-brown, soft and thick, peeling in vertical strips. ***Flowers*** Males yellow-brown, in the leaf axils, females green, at the shoot tips, in separate clusters on same plant in early spring. ***Fruit*** A rounded, brown cone, ¾ in (2 cm) across.

- **NATIVE REGION** Japan.
- **HABITAT** Forests.



'LOBBII' ∇
The foliage of this form is borne on longer branchlets.

Δ 'CRISTATA'
This much smaller form grows to about 33 ft (10 m).



Height 100 ft (30 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family TAXODIACEAE	Species *Cunninghamia lanceolata*	Author (A.B. Lambert) W.J. Hooker

CHINESE FIR

Leaves Strap-shaped, to 2½ in (6 cm) long, glossy green, with two white bands beneath. ***Bark*** Red-brown, ridged. ***Flowers*** Males yellow-brown, in clusters, females yellow-green, in single clusters, at shoot tips. ***Fruit*** A rounded cone, to 1½ in (4 cm) across, green then brown.

- **NATIVE REGION** China.
- **HABITAT** Evergreen forests.

Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family TAXODIACEAE	Species *Glyptostrobus pensilis*	Author (Staunton) K. Koch

CHINESE SWAMP CYPRESS

Leaves Linear, scalelike, to ⅝ in (1.5 cm) long, blue-green, spreading either side of deciduous side shoots, arranged spirally on persistent shoots, turning red in late autumn when they fall. ***Bark*** Gray-brown, with shallow fissures. ***Flowers*** Males and females inconspicuous. ***Fruit*** A rounded to egg-shaped rough, green cone, 1 in (2.5 cm) long.

- **NATIVE REGION** S.E. China.
- **HABITAT** Swamps and riverbanks.
- **REMARK** This species is now seen only rarely in the wild.

Height 33 ft (10 m)	Shape Narrowly conical	Leaf persistence Deciduous	Leaf type

Family TAXODIACEAE	Species *Metasequoia glyptostroboides*	Author Hu & Cheng

DAWN REDWOOD

Leaves Linear, to 1 in (2.5 cm) long, soft, flattened, emerging early and pale green becoming dark green, arranged opposite on short, deciduous side shoots, spirally on persistent shoots, turning yellow, pink, or red in autumn. ***Bark*** Orange-brown to red-brown, peeling vertically in stringy flakes. ***Flowers*** Males yellow, females greenish, in separate clusters on young shoots, on the same plant in spring. ***Fruit*** A rounded cone, 1 in (2.5 cm) across, green ripening to brown.

- **NATIVE REGION** S.W. China.
- **HABITAT** Moist ground and riverbanks.

Height 130 ft (40 m)	Shape Narrowly conical	Leaf persistence Deciduous	Leaf type

Family TAXODIACEAE	Species *Sciadopitys verticillata*	Author Siebold & Zuccarini

UMBRELLA PINE

Leaves Needlelike, to 4¾ in (12 cm) long, deeply grooved on both sides, deep green above, yellow-green beneath. ***Bark*** Red-brown, peeling in long, vertical strips. ***Flowers*** Males yellow, in many clusters, females green, at the ends of the shoots, on the same plant in spring. ***Fruit*** An egg-shaped cone, to 3 in (7.5 cm) long, green ripening to red-brown in two years.

- **NATIVE REGION** Japan.
- **HABITAT** Mountains.

Height 80 ft (25 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family TAXODIACEAE	Species *Sequoia sempervirens*	Author (D. Don) Endlicher

CALIFORNIA REDWOOD

Leaves Linear, to ¾ in (2 cm) long, pointed at the tip, dark green above, with two white bands beneath, spreading either side of the shoot. ***Bark*** Red-brown, soft, fibrous, thick, with broad ridges. ***Flowers*** Males yellow-brown, females green, borne in separate clusters on the same plant in late winter to early spring. ***Fruit*** A barrel-shaped to rounded, red-brown cone, to 1¼ in (3 cm) long, ripe in one year.

- **NATIVE REGION** California, S. Oregon.
- **HABITAT** Low slopes in coastal regions.
- **REMARK** The tallest species of tree.

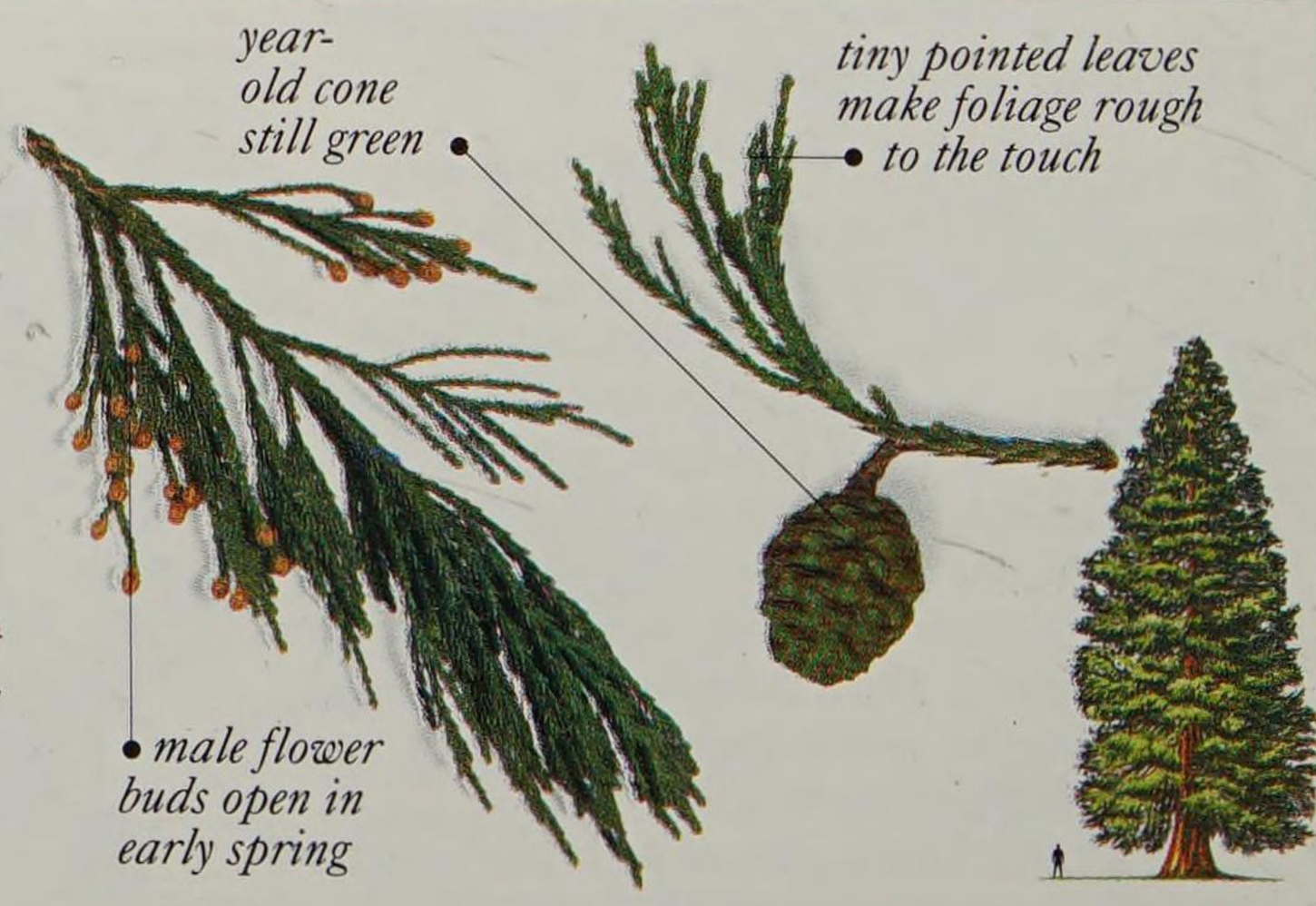
Height 330 ft (100 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family TAXODIACEAE	Species *Sequoiadendron giganteum*	Author (Lindley) Buchholz

GIANT SEQUOIA

Leaves To 5/16 in (8 mm) long, sharp-pointed, with spreading tips, deep blue-green, all around the shoot. ***Bark*** Red-brown, soft, fibrous, very thick. ***Flowers*** Males yellow, at the ends of the shoots, females green, in separate clusters in early spring. ***Fruit*** A barrel-shaped cone, to 3 in (7.5 cm) long, green ripening to brown in two years, often persisting for years.

- **NATIVE REGION** California.
- **HABITAT** West-facing mountain slopes.



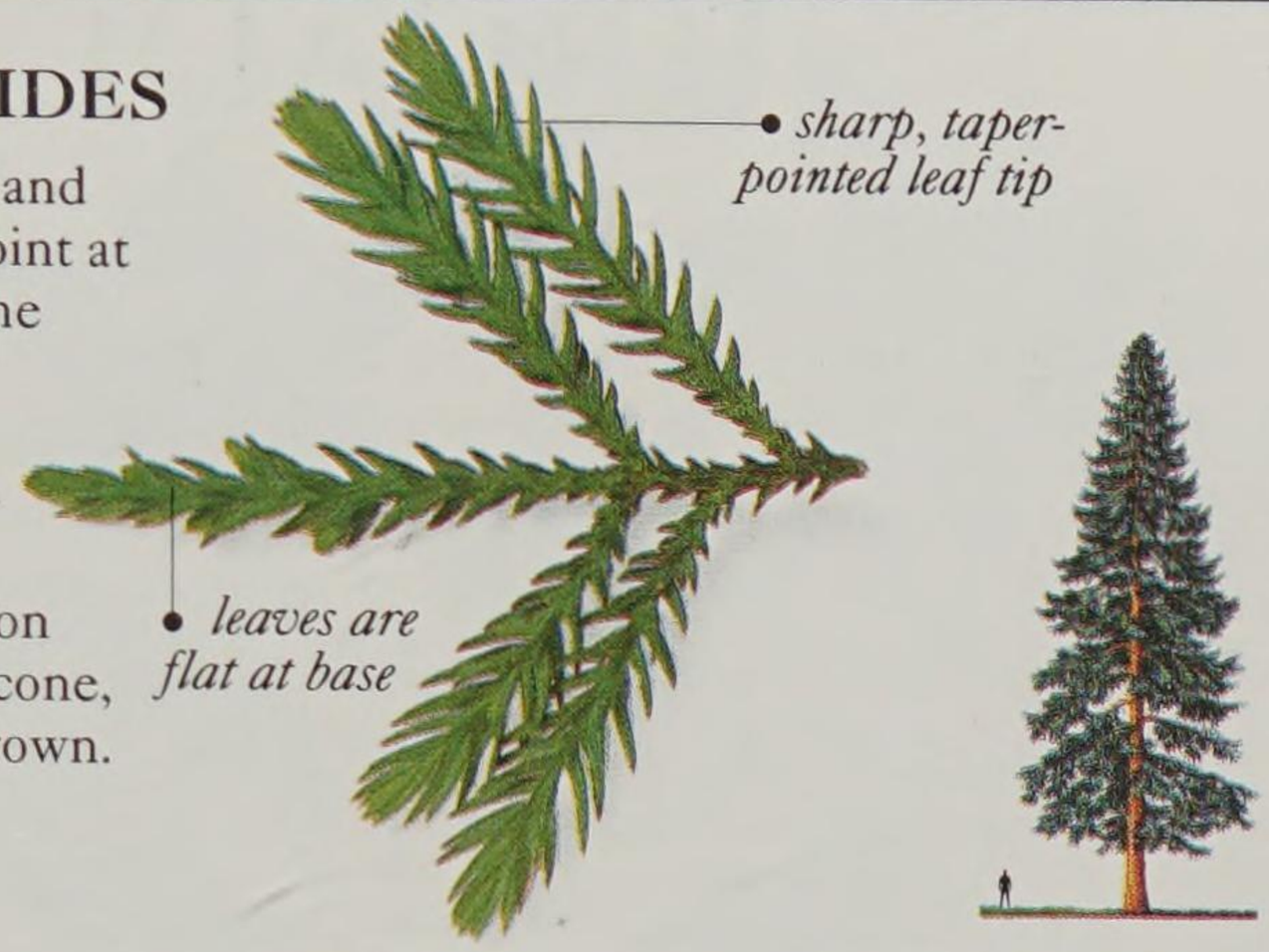
Height 260 ft (80 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family TAXODIACEAE	Species *Taiwania cryptomerioides*	Author Hayata

TAIWANIA CRYPTOMERIOIDES

Leaves Slender, to ¾ in (2 cm) long, broad and flattened at the base, with a sharp, spiny point at the tip, blue-green, curved forward along the shoots; on coning shoots much smaller. ***Bark*** Red-brown, peeling in vertical strips. ***Flowers*** Males in several clusters together, females in single clusters, borne separately at the ends of the shoots, on the same plant in spring. ***Fruit*** A rounded cone, to ½ in (1.2 cm) across, green ripening to brown.

- **NATIVE REGION** Taiwan.
- **HABITAT** Mountain forests.



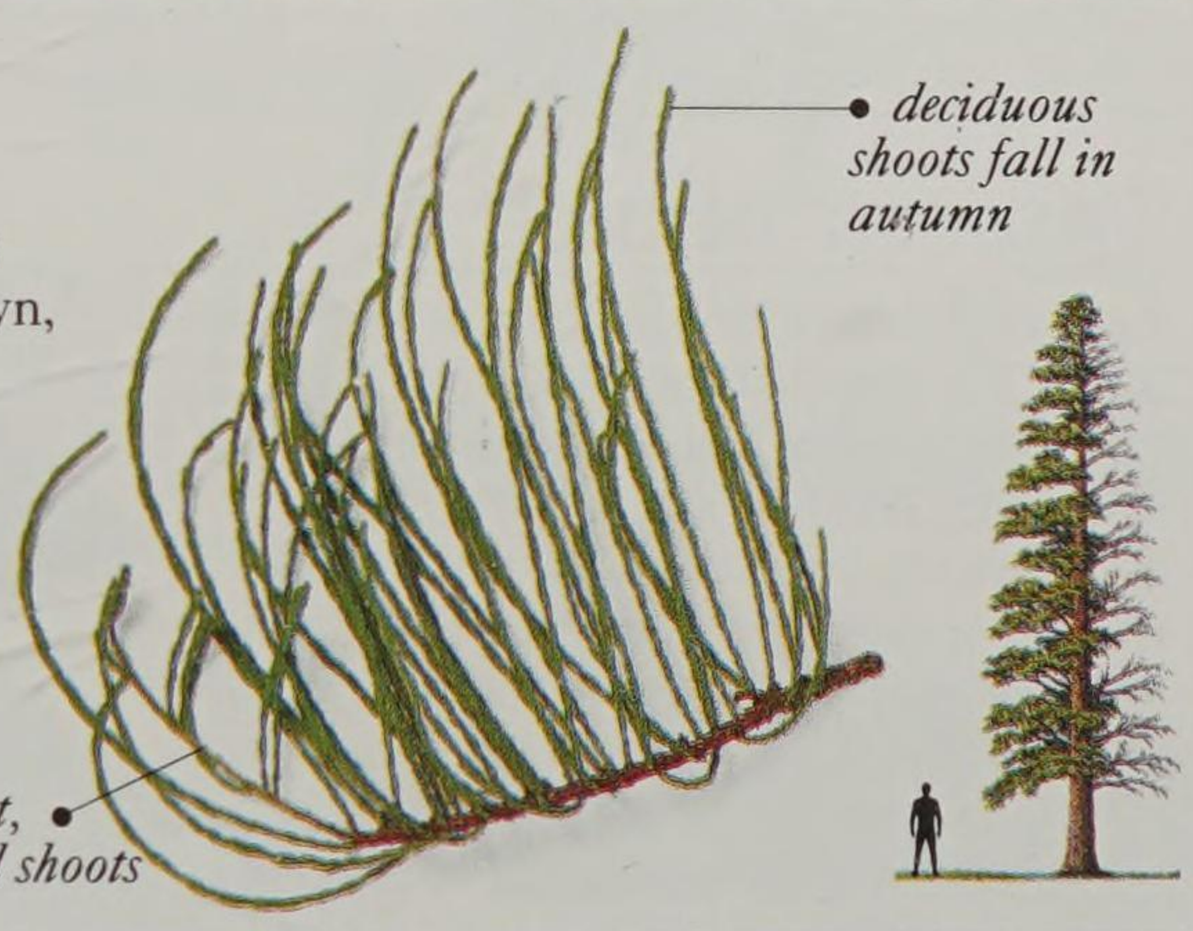
Height 200 ft (60 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family TAXODIACEAE	Species *Taxodium ascendens*	Author Brongniart

POND CYPRESS

Leaves Linear, to ⅜ in (1 cm) long, closely pressed against and around upright, deciduous shoots, later spreading slightly. ***Bark*** Red-brown, thick, coarsely ridged. ***Flowers*** Males yellow-green, in hanging catkins to 8 in (20 cm) long, females green, in small clusters at the base of the male catkins, on the same plant, forming in autumn but opening in spring. ***Fruit*** A rounded cone, to 1¼ in (3 cm) long.

- **NATIVE REGION** S.E. United States.
- **HABITAT** Swamps and by lakes.



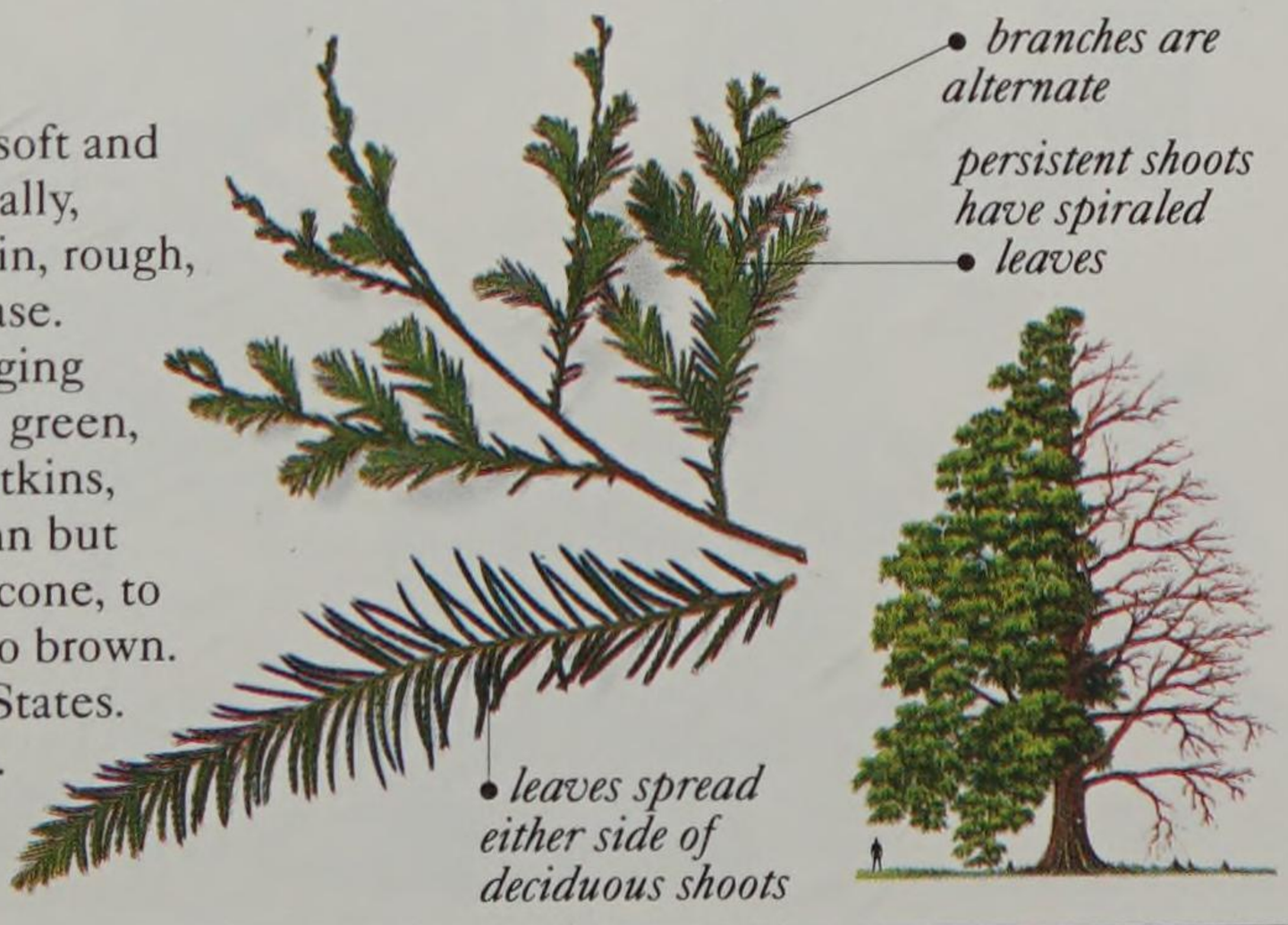
Height 100 ft (30 m)	Shape Narrowly columnar	Leaf persistence Deciduous	Leaf type

Family TAXODIACEAE	Species *Taxodium distichum*	Author (Linnaeus) Richard

BALD CYPRESS

Leaves Linear, to ¾ in (2 cm) long, soft and flattened, arranged spreading or spirally, emerging late. ***Bark*** Gray-brown, thin, rough, often fluted and buttressed at the base. ***Flowers*** Males yellow-green, in hanging catkins to 8 in (20 cm) long, females green, in clusters at the base of the male catkins, on the same plant, forming in autumn but opening in spring. ***Fruit*** A rounded cone, to 1¼ in (3 cm) across, green ripening to brown.

- **NATIVE REGION** S.E. United States.
- **HABITAT** Swamps, streambanks.
- **REMARK** Also known as swamp cypress.



Height 130 ft (40 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

BROADLEAVES

ACERACEAE

THE MAPLE FAMILY has two genera and over 100 species of evergreen and deciduous trees and shrubs. Some extend to the tropics, but most occur in northern temperate regions.

The opposite leaves are often lobed, sometimes merely toothed, or may be divided into several leaflets. The small male and female flowers vary from cream to yellow, green, red, or purple. They are borne, sometimes separately, on the same or different plants, usually opening as the young foliage unfolds. The winged fruits are in two halves. In maples *(Acer)*, one side of each half has an elongated wing; in *Dipteronia*, each half is winged all the way around.

Family ACERACEAE	Species *Acer buergerianum*	Author Miquel

TRIDENT MAPLE

Leaves Palmate, to 4 in (10 cm) long and across, narrowed at the base, with three forward-pointing lobes, usually untoothed or sparsely toothed at the margin, dark green above, bluish beneath, becoming smooth on both sides, turning red in autumn. ***Bark*** Gray-brown, peeling in scaly plates with age. ***Flowers*** Small and yellow-green, in broadly conical upright clusters in spring with the young leaves. ***Fruit*** With parallel, upright wings, to 1 in (2.5 cm) long, green or reddish at first ripening to brown.

• **NATIVE REGION**
China, Japan.

• **HABITAT** Mountain woods.

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer campestre*	Author Linnaeus

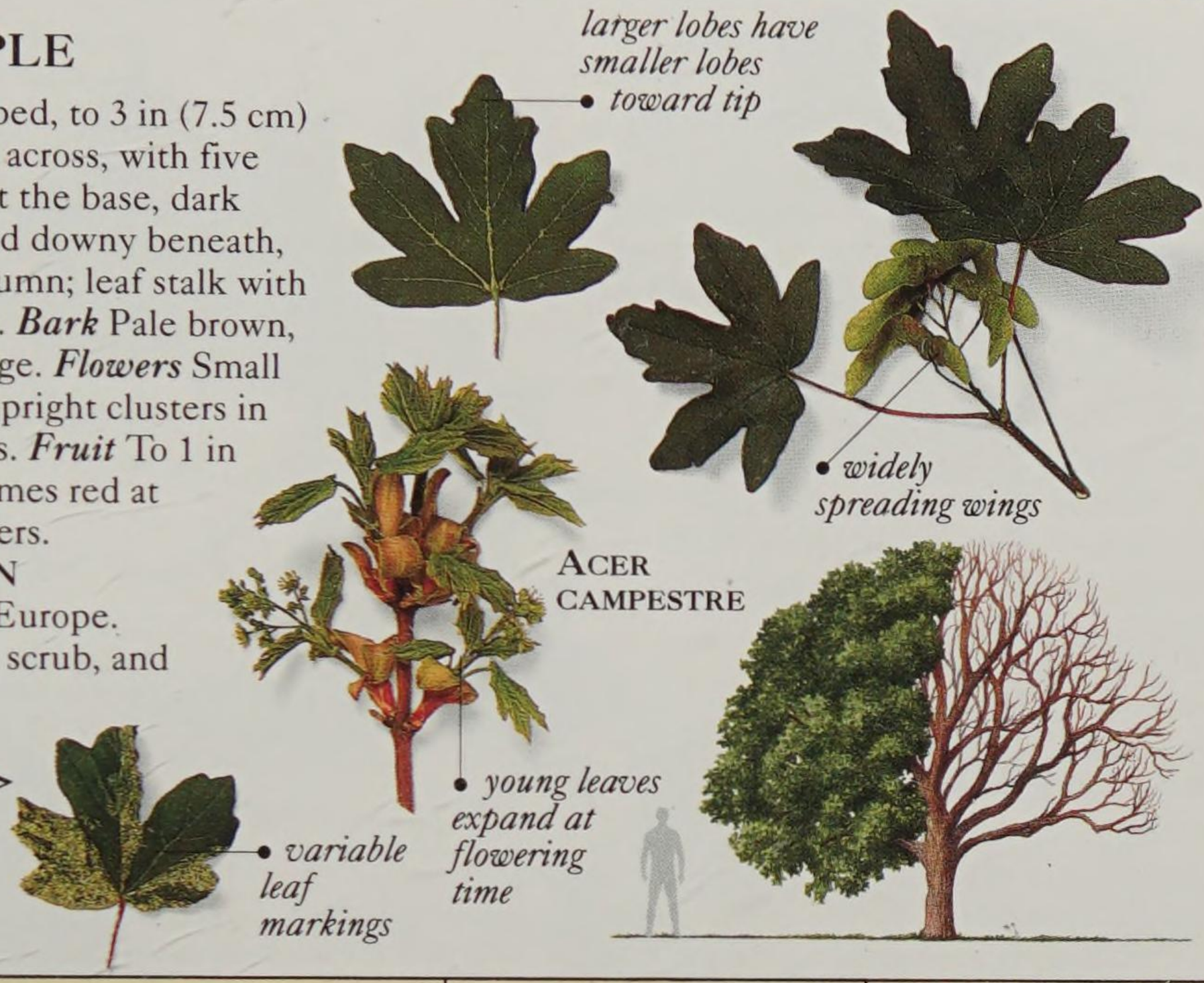
HEDGE MAPLE

Leaves Palmately lobed, to 3 in (7.5 cm) long and 4 in (10 cm) across, with five lobes, heart-shaped at the base, dark green above, paler and downy beneath, turning yellow in autumn; leaf stalk with milky juice when cut. ***Bark*** Pale brown, corky, fissured with age. ***Flowers*** Small and green, borne in upright clusters in spring with the leaves. ***Fruit*** To 1 in (2.5 cm) long, sometimes red at first, in hanging clusters.

• **NATIVE REGION**
N. Africa, S.W. Asia, Europe.

• **HABITAT** Woods, scrub, and hedgerows.

'PULVERULENTUM' ▷
The smaller leaves of this form are heavily mottled with white.



ACER CAMPESTRE

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer capillipes*	Author Maximowicz

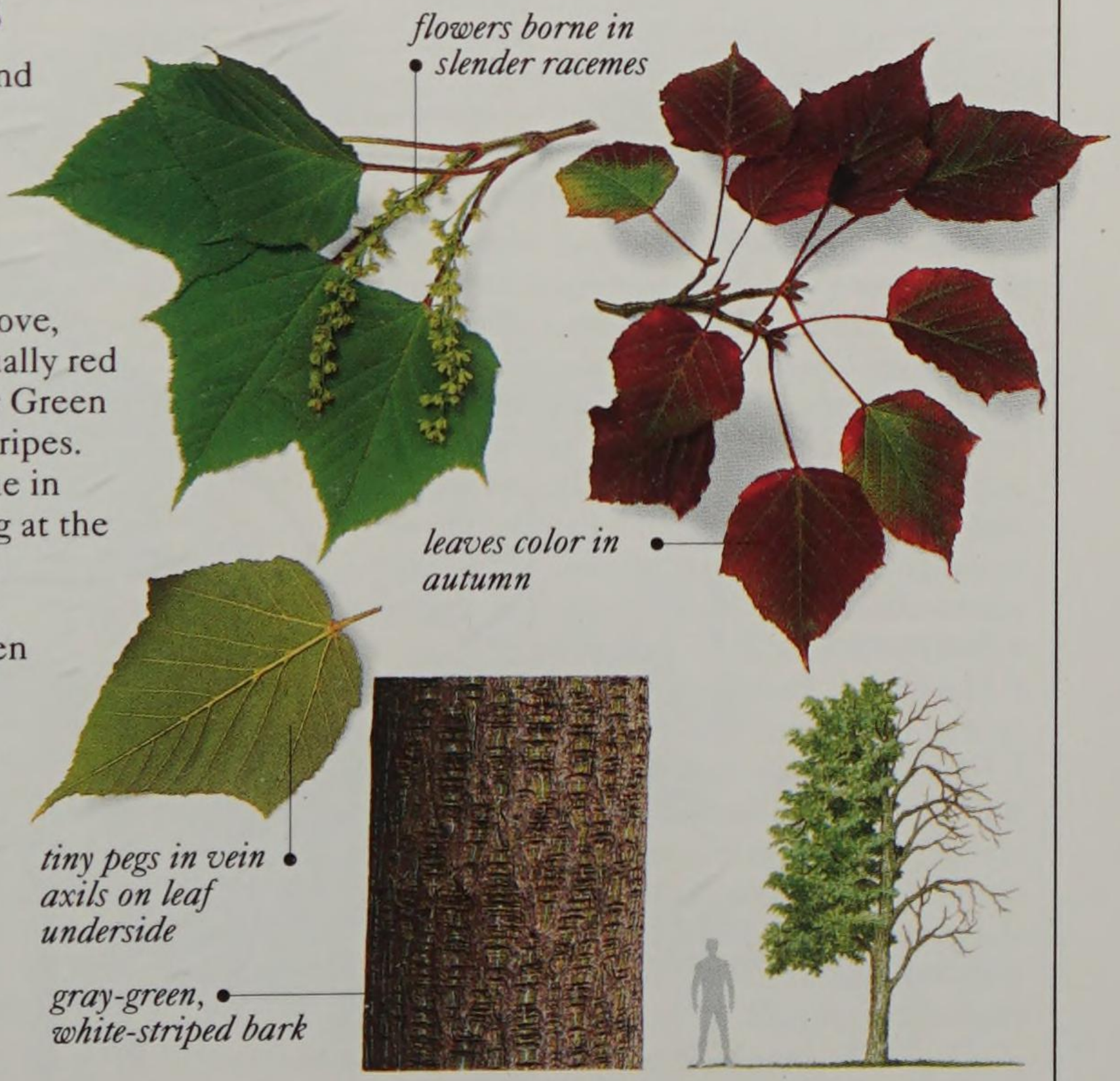
ACER CAPILLIPES

Leaves To 6 in (15 cm) long and 4 in (10 cm) across, with three lobes, the central lobe much the largest, the side lobes short, all tapering to a slender point, toothed, red when young becoming rich green above, paler and smooth beneath, usually red in autumn, on red stalks. ***Bark*** Green and gray, with vertical white stripes. ***Flowers*** Small and green, borne in drooping racemes in late spring at the same time as the young leaves emerge. ***Fruit*** With spreading wings, to ¾ in (2 cm) long, green ripening to red.

• **NATIVE REGION** Japan.

• **HABITAT** Woods by mountain streams, on moist soil.

• **REMARK** This species is one of the stripe-bark maples, which are easily distinguished by their characteristically striped bark.



Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer cappadocicum*	Author Gleditsch

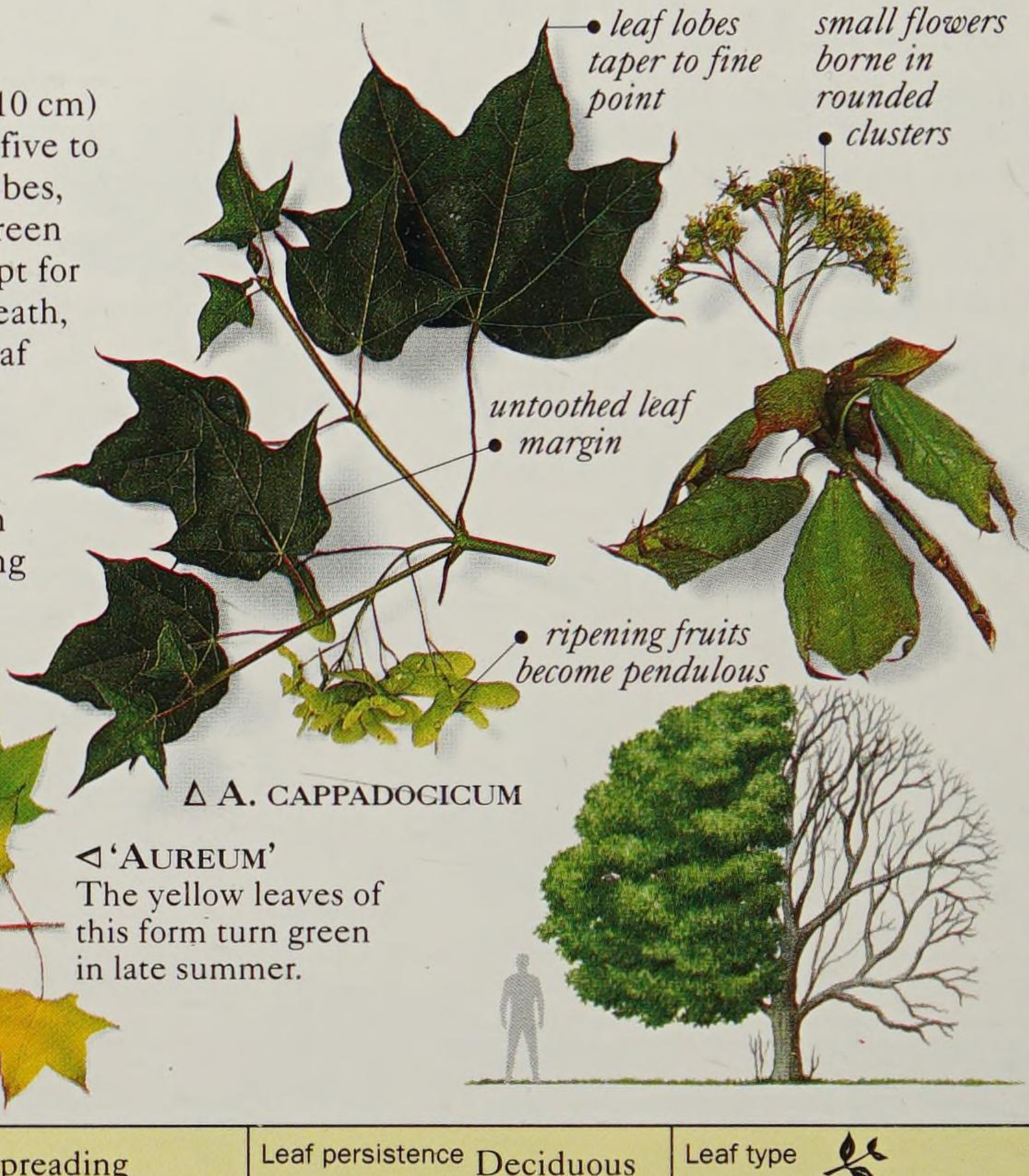
COLISEUM MAPLE

Leaves Palmately lobed, to 4 in (10 cm) long and 6 in (15 cm) across, with five to seven taper-pointed, untoothed lobes, heart-shaped at the base, bright green above, smooth on both sides except for tufts of hairs in the vein axils beneath, turning clear yellow in autumn; leaf stalk with milky juice when cut. ***Bark*** Gray and smooth. ***Flowers*** Small and yellow-green, borne in upright clusters in late spring with young leaves. ***Fruit*** With spreading wings, to 1½ in (4 cm) long.

• **NATIVE REGION** W. Asia to China.

• **HABITAT** Forests.

• **REMARK** In Tibet, burrs on the trunk of the tree are made into drinking cups.



△ A. CAPPADOCICUM

◁ 'AUREUM'
The yellow leaves of this form turn green in late summer.

Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer carpinifolium*	Author Siebold & Zuccarini

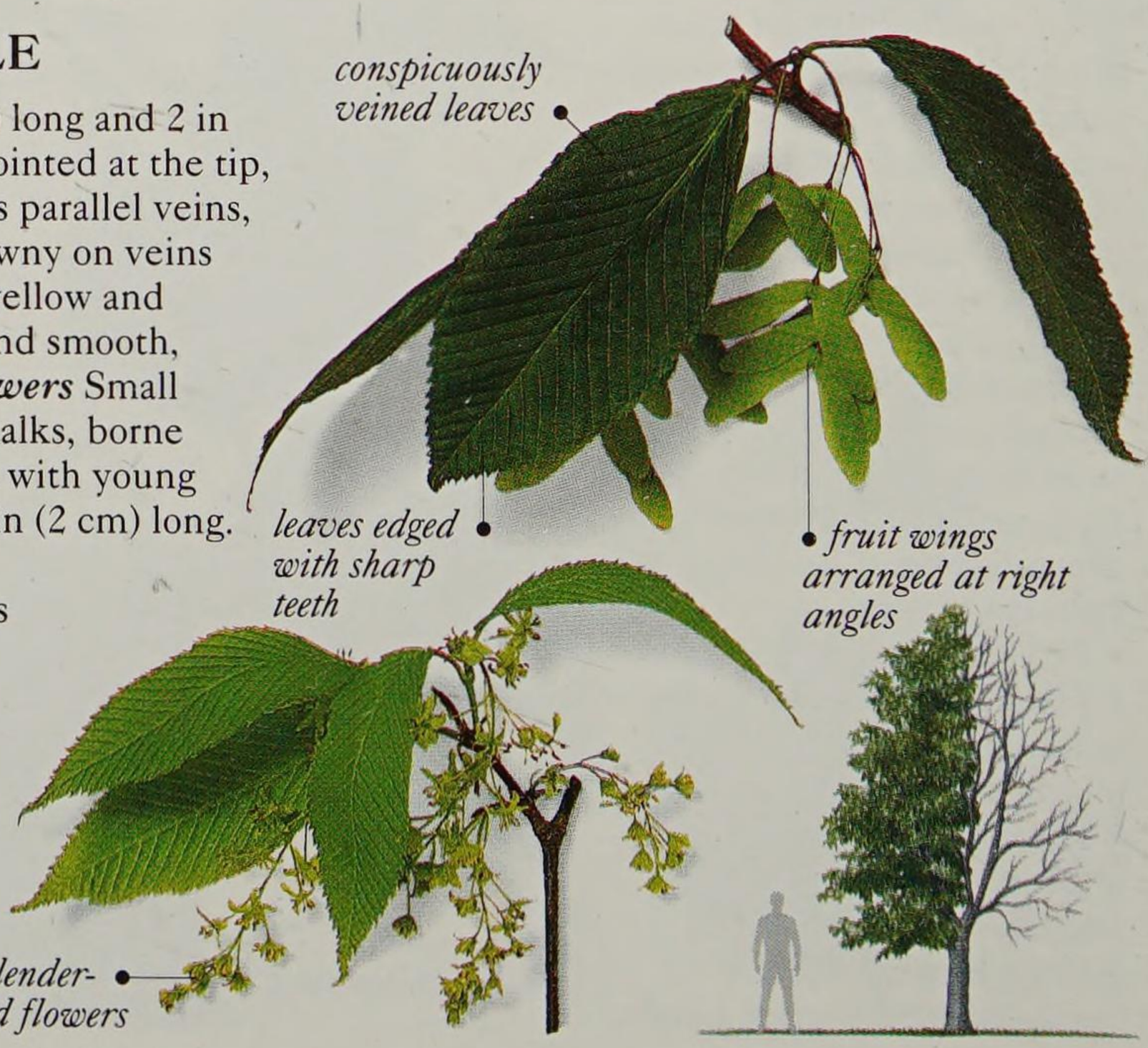
HORNBEAM MAPLE

Leaves Oblong, to 6 in (15 cm) long and 2 in (5 cm) across, unlobed, taper-pointed at the tip, sharply toothed, with numerous parallel veins, dark green above, paler and downy on veins when young beneath, turning yellow and brown in autumn. ***Bark*** Gray and smooth, with conspicuous lenticels. ***Flowers*** Small and yellow-green, on slender stalks, borne in hanging clusters, late spring, with young leaves. ***Fruit*** With wings, to ¾ in (2 cm) long.

• **NATIVE REGION** Japan.

• **HABITAT** Deciduous woods by mountain streams.

• **REMARK** This unusual species is named for the resemblance of its leaves to those of the hornbeams (*Carpinus*, see pp.126–127), which distinguishes it from other maples.



Height 33 ft (10 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

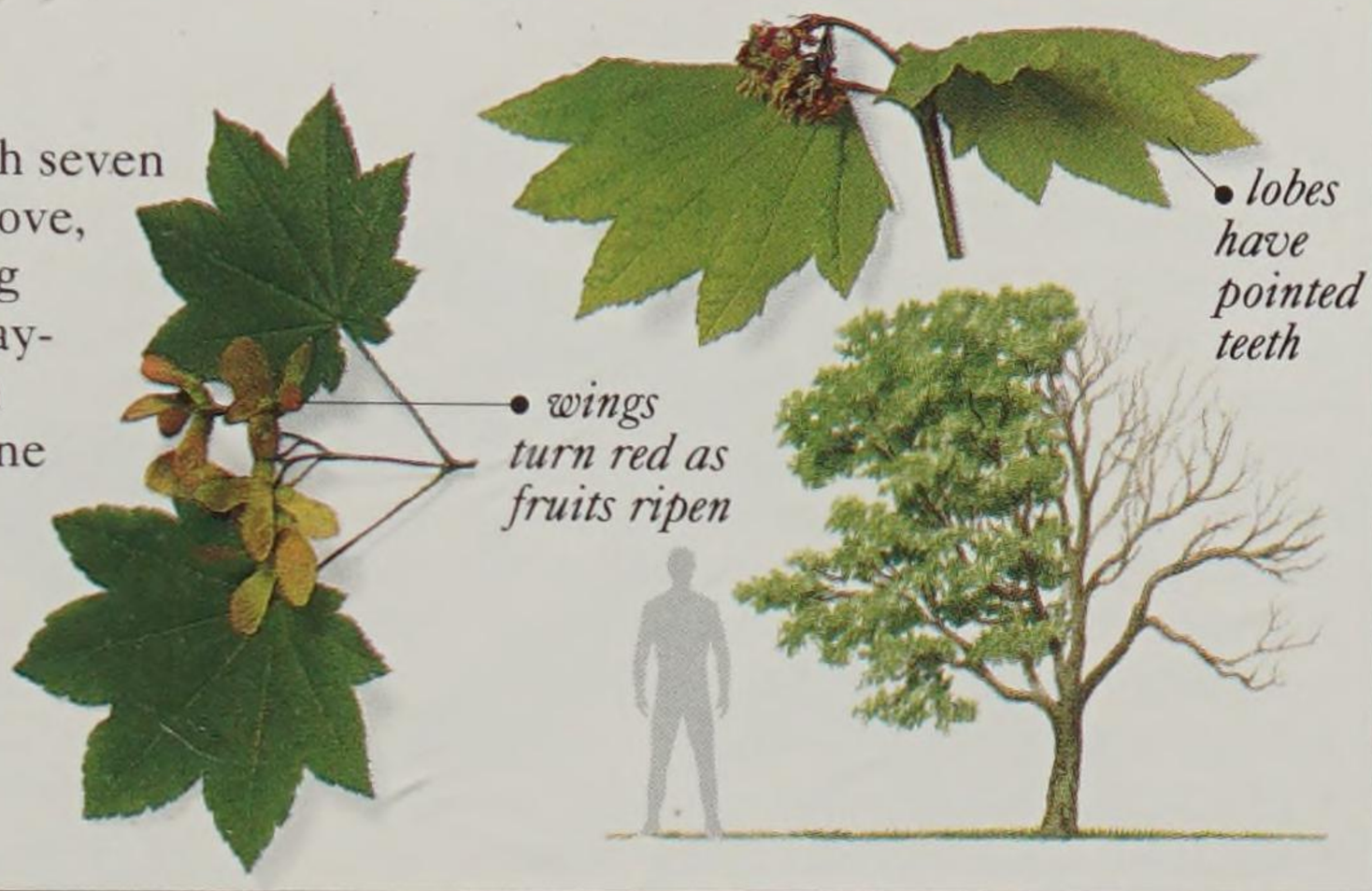
Family ACERACEAE	Species *Acer circinatum*	Author Pursh

VINE MAPLE

Leaves To 4¾ in (12 cm) across, with seven to nine toothed lobes, pale green above, downy when young beneath, turning orange and red in autumn. ***Bark*** Gray-brown, smooth. ***Flowers*** Small, with white petals and reddish sepals, borne in drooping clusters in late spring. ***Fruit*** With spreading, reddish wings, to 1¼ in (3 cm) long.

• **NATIVE REGION**
W. North America.

• **HABITAT** Evergreen forests.



Height 20 ft (6 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

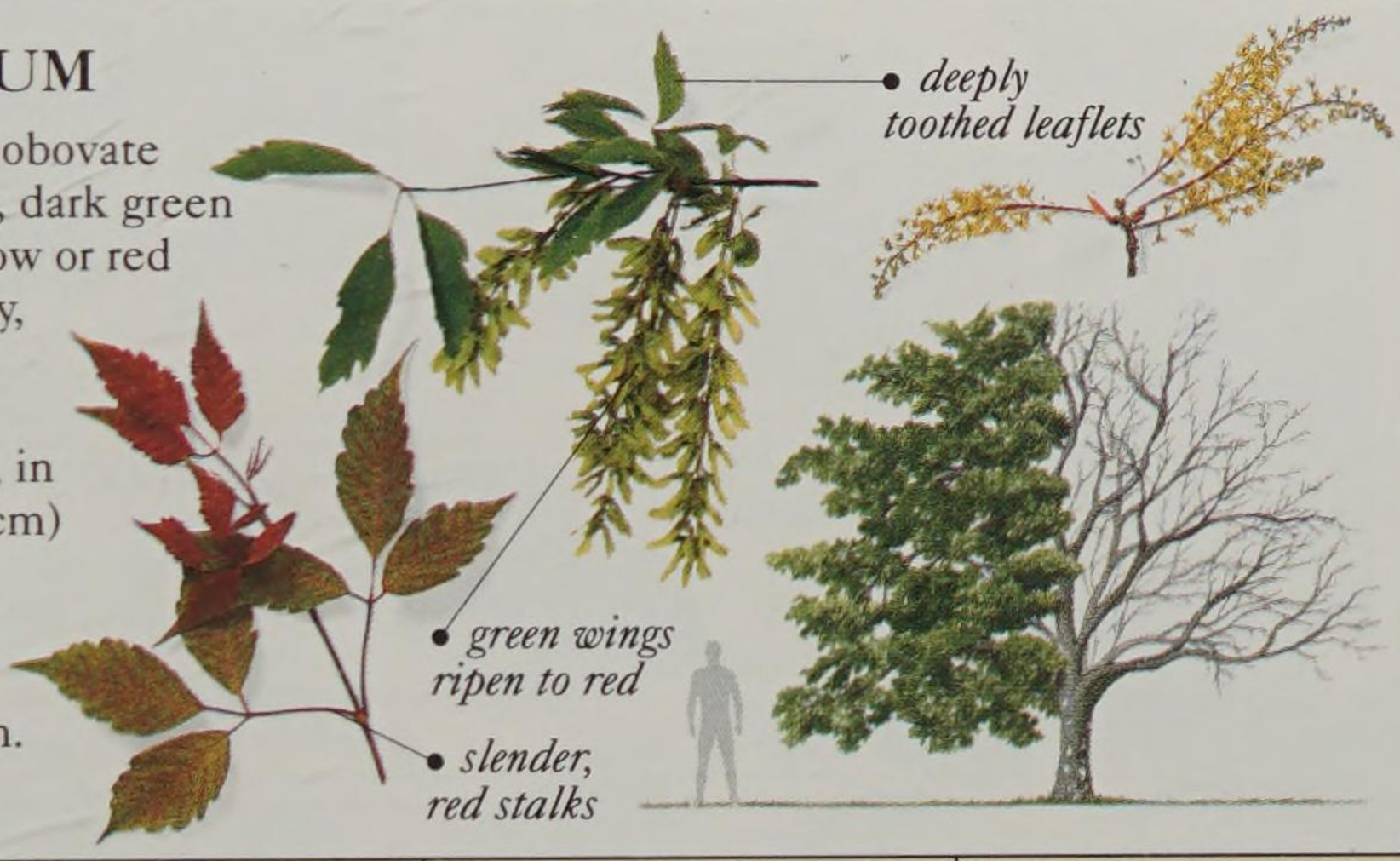
Family ACERACEAE	Species *Acer cissifolium*	Author (Siebold & Zuccarini) K. Koch

ACER CISSIFOLIUM

Leaves With three ovate to obovate leaflets, to 4 in (10 cm) long, dark green above, smooth, turning yellow or red in autumn. ***Bark*** Yellow-gray, rough, with raised lenticels. ***Flowers*** Males and females both tiny, yellow, numerous, in slender racemes to 4 in (10 cm) long, on separate plants in spring. ***Fruit*** With nearly parallel wings.

• **NATIVE REGION** Japan.

• **HABITAT** By streams.



Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

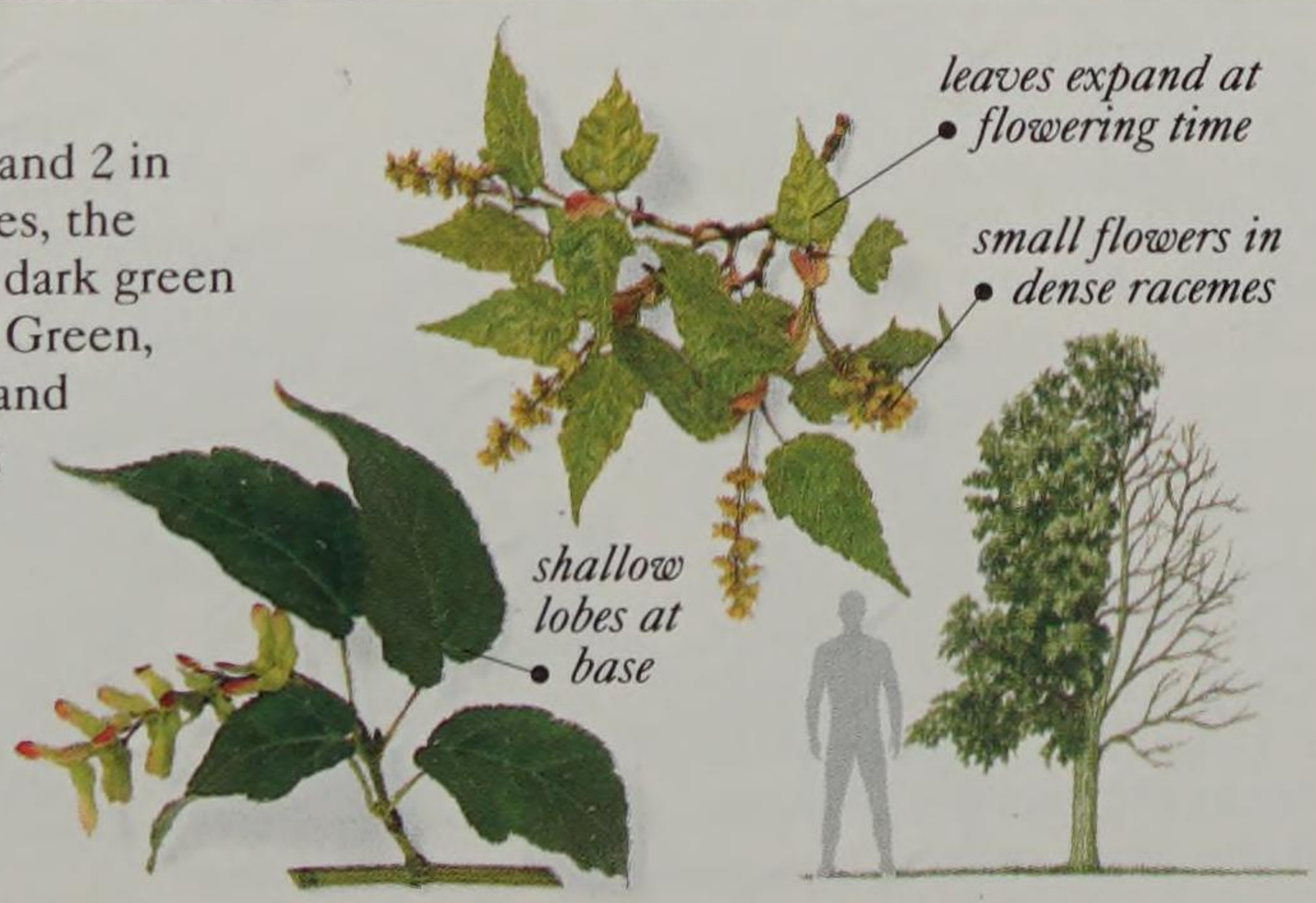
Family ACERACEAE	Species *Acer crataegifolium*	Author Siebold & Zuccarini

HAWTHORN MAPLE

Leaves Ovate, to 3 in (7.5 cm) long and 2 in (5cm) across, with three toothed lobes, the central lobe long and taper-pointed, dark green above, paler beneath, smooth. ***Bark*** Green, with vertical stripes. ***Flowers*** Small and yellow-green, in upright or drooping racemes in spring with the leaves. ***Fruit*** With spreading, red-tinged wings, to 1¼ in (3 cm) long.

• **NATIVE REGION**
C. and S. Japan.

• **HABITAT** Forests and sunny places on low mountains.



Height 23 ft (7 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer davidii*	Author Franchet

DAVID MAPLE

Leaves Ovate, to 6 in (15 cm) long and 4 in (10 cm) across, either with small lobes or unlobed, heart-shaped at the base, toothed, glossy dark green above, downy when young beneath, some forms turning orange in autumn. ***Bark*** Green, with vertical white stripes, becoming gray and cracking with age. ***Flowers*** Small, green, in drooping racemes in late spring with the young leaves. ***Fruit*** With spreading wings, to 1¼ in (3 cm) long.

• **NATIVE REGION** China.

• **HABITAT** Mountain thickets and woods.

• **REMARK** The species is one of the stripe-bark maples, and is variable in size and shape of leaf. Several cultivated forms are grown in gardens.

Δ ACER DAVIDII

Δ 'GEORGE FORREST'
The dark leaves of this form scarcely color in autumn.

Δ 'ERNEST WILSON'
The large leaves of this form turn orange in autumn.

Height 50 ft (15 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer ginnala*	Author Maximowicz

AMUR MAPLE

Leaves Ovate, to 3 in (7.5 cm) long and 2½ in (6 cm) across, with three deep lobes, the central lobe largest, toothed, glossy dark green above, smooth, turning bright red in early autumn. ***Bark*** Dark gray-brown, smooth. ***Flowers*** Creamy white, fragrant, in upright clusters in late spring after the young leaves. ***Fruit*** With nearly parallel, red-tinged wings, to 1 in (2.5 cm) long, in drooping clusters.

• **NATIVE REGION** China, Japan.

• **HABITAT** Thickets by river-banks and exposed positions in mountain valleys.

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer griseum*	Author (Franchet) Pax

PAPERBARK MAPLE

Leaves With three elliptic leaflets, each with several large, blunt teeth on each side, the central leaflet to 4 in (10 cm) long and 2 in (5 cm) across, dark green above, blue-white and densely covered with soft hairs beneath, turning red in autumn. ***Bark*** Reddish to pale cinnamon-brown, peeling in thin, papery flakes. ***Flowers*** Small, yellow-green, on hairy stalks, in drooping clusters in late spring with the young leaves. ***Fruit*** With broad, pale green wings, to 1¼ in (3 cm) long.

• **NATIVE REGION**
C. China.

• **HABITAT**
Mountain woods.

• **REMARK** Easily distinguished by its peeling bark.

Height 50 ft (15 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

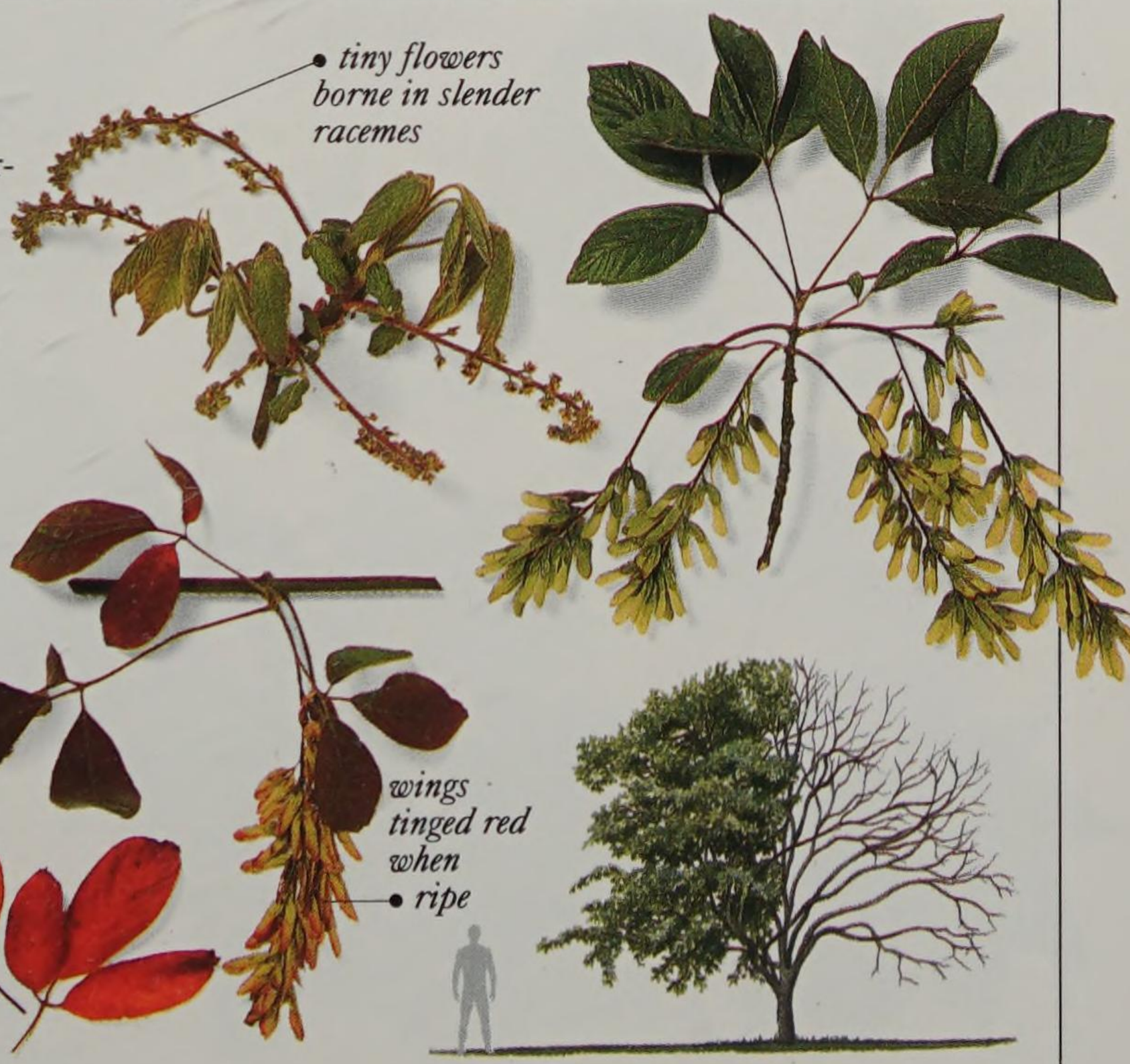
Family ACERACEAE	Species *Acer henryi*	Author Pax

HENRY MAPLE

Leaves With three elliptic, untoothed or few-toothed, taper-pointed leaflets, to 4 in (10 cm) long and 1½ in (4 cm) across, dark green above, usually hairy beneath, turning brilliant red in autumn. ***Bark*** Gray, with conspicuous raised lenticels. ***Flowers*** Tiny and yellowish, numerous, borne in slender racemes to 8 in (20 cm) long, in spring before or with the leaves. ***Fruit*** With nearly parallel wings, to 1 in (2.5 cm) long.

• **NATIVE REGION**
C. China.

• **HABITAT**
Mountain woods.



Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer japonicum*	Author Thunberg

FULLMOON MAPLE

Leaves Rounded in outline, with 7 to 11 taper-pointed, sharply toothed, ovate to lanceolate lobes, to 5 in (13 cm) long and across, silky-hairy on both sides when young, becoming dark green above, nearly smooth on both sides, turning red in autumn, carried on downy stalks. ***Bark*** Gray-brown and smooth. ***Flowers*** Small and red-purple, with yellow anthers, borne in long-stalked, drooping clusters in spring as the young leaves emerge. ***Fruit*** With spreading wings, green or green tinged red, to 1 in (2.5 cm) long.

• **NATIVE REGION** Japan.

• **HABITAT** Mountain woods, usually in dry, sunny situations.

• **REMARK** The form shown, 'Vitifolium' has somewhat larger leaves, with 10 to 12 lobes, and bronzy young foliage.

'VITIFOLIUM' ▷

numerously lobed leaves

heart-shaped leaf base

leaves turn deep red in autumn

△ 'VITIFOLIUM'

△ 'VITIFOLIUM'

◁ 'VITIFOLIUM'

flower clusters droop on long stalks

red-purple flower petals

△ 'VITIFOLIUM'

◁ 'VITIFOLIUM'

◁ 'ACONITIFOLIUM' The leaves of this form are deeply lobed and toothed.

spreading fruit wings

leaves cut to base in slender lobes

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

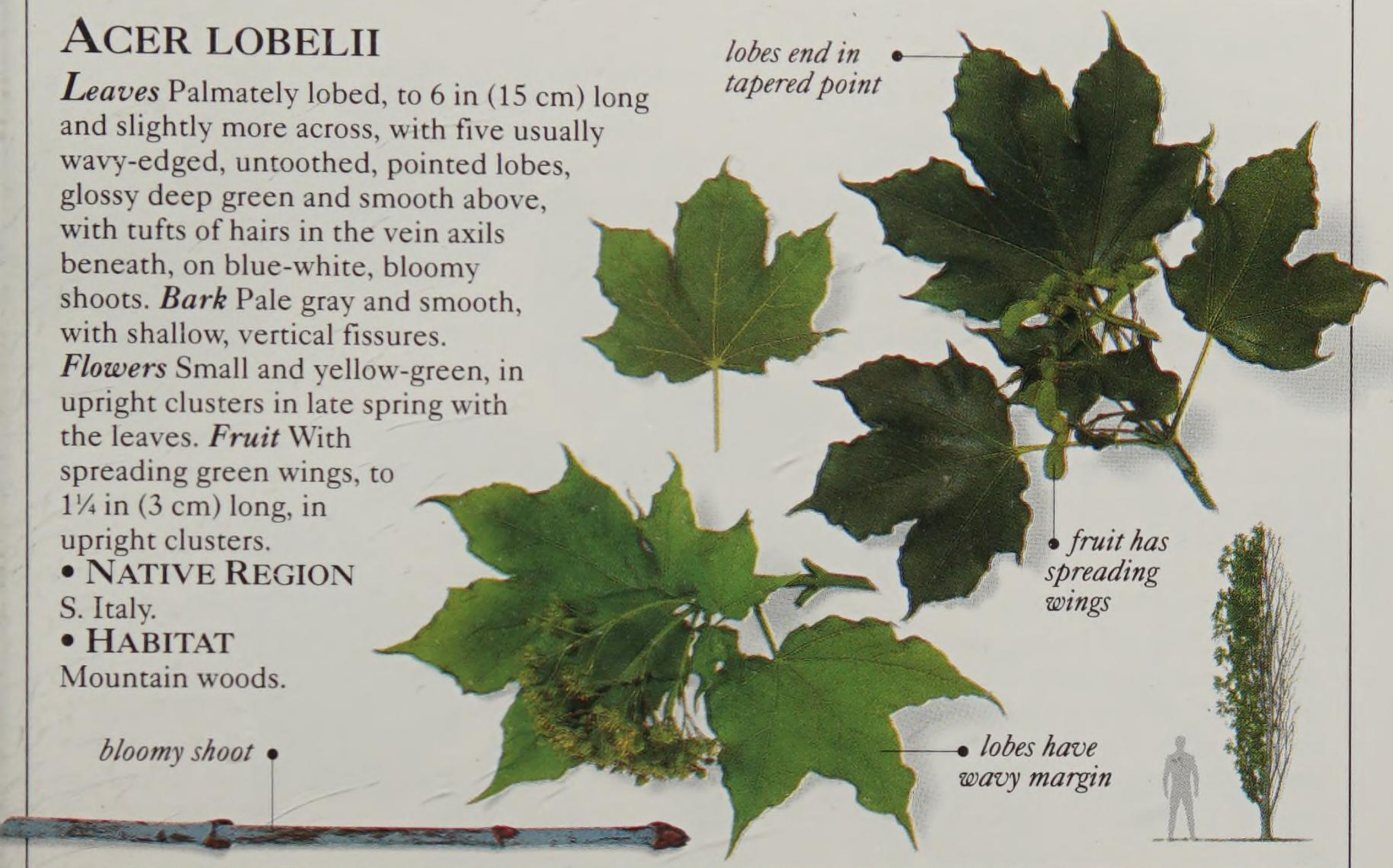
Family ACERACEAE	Species *Acer lobelii*	Author Tenore

ACER LOBELII

Leaves Palmately lobed, to 6 in (15 cm) long and slightly more across, with five usually wavy-edged, untoothed, pointed lobes, glossy deep green and smooth above, with tufts of hairs in the vein axils beneath, on blue-white, bloomy shoots. ***Bark*** Pale gray and smooth, with shallow, vertical fissures. ***Flowers*** Small and yellow-green, in upright clusters in late spring with the leaves. ***Fruit*** With spreading green wings, to 1¼ in (3 cm) long, in upright clusters.

• **NATIVE REGION**
S. Italy.

• **HABITAT**
Mountain woods.



Height 65 ft (20 m)	Shape Narrowly columnar	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer macrophyllum*	Author Pursh

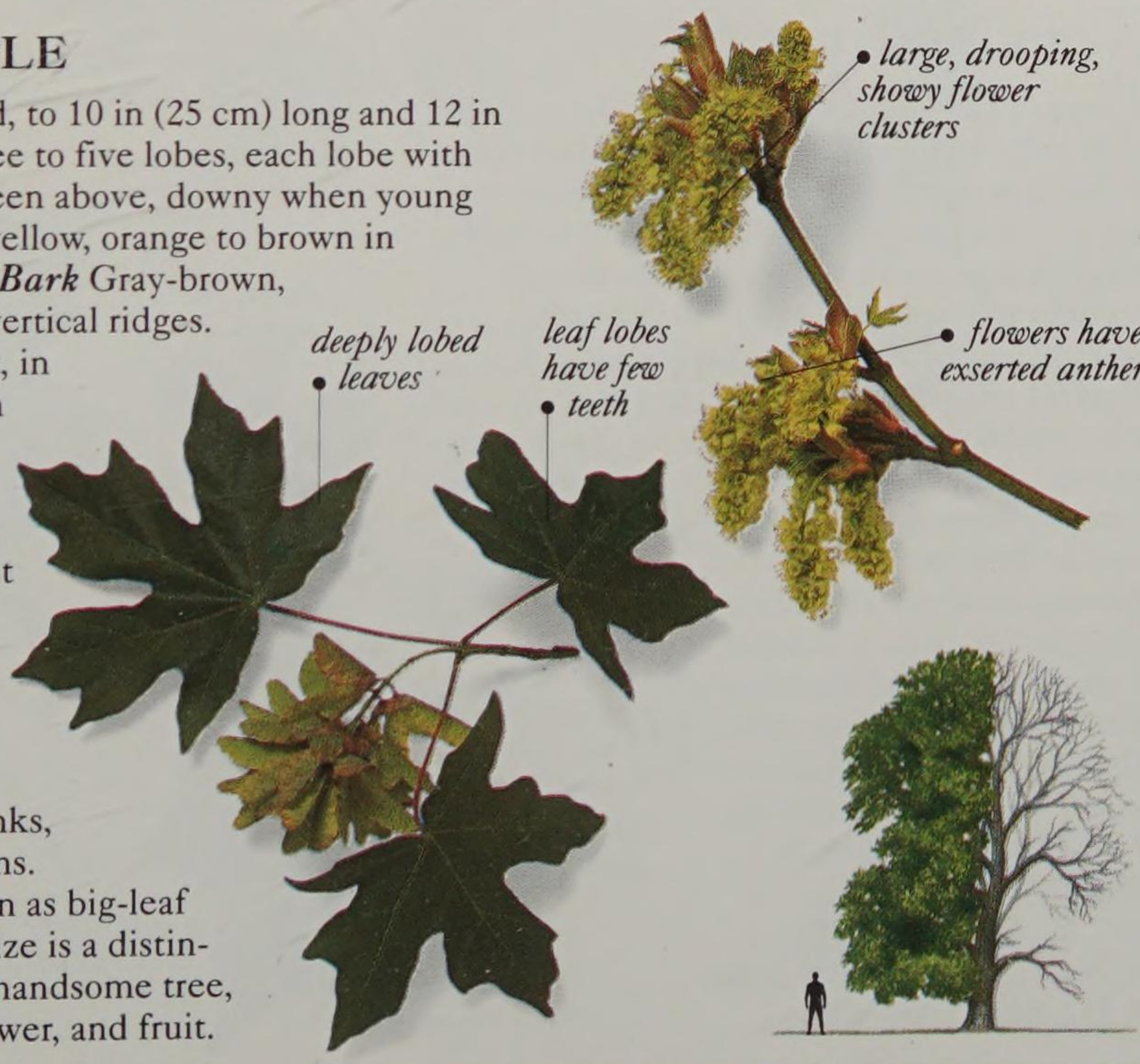
OREGON MAPLE

Leaves Palmately lobed, to 10 in (25 cm) long and 12 in (30 cm) across, with three to five lobes, each lobe with few large teeth, dark green above, downy when young beneath, turning deep yellow, orange to brown in autumn, on long stalks. ***Bark*** Gray-brown, shallowly fissured into vertical ridges. ***Flowers*** Yellow, fragrant, in hanging clusters to 10 in (25 cm) long, in spring as the leaves emerge. ***Fruit*** Bristly, with large, smooth wings set at right angles, to 2 in (5 cm) long, borne in large, hanging clusters.

• **NATIVE REGION**
W. North America.

• **HABITAT** Streambanks, moist woods, and canyons.

• **REMARK** Also known as big-leaf maple, canyon maple. Size is a distinguishing feature of this handsome tree, which is bold in leaf, flower, and fruit.



Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer maximowiczianum*	Author Miquel

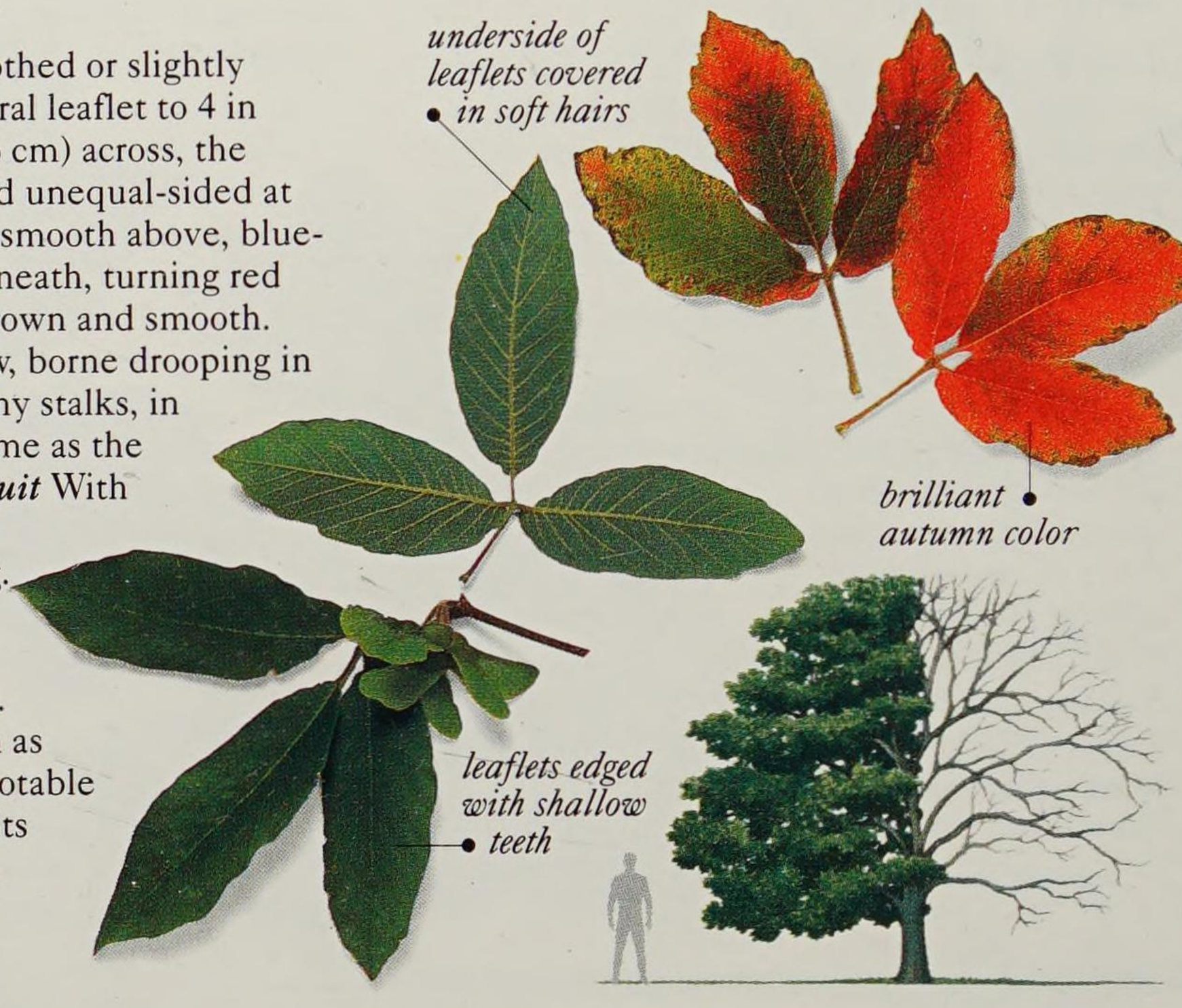
NIKKO MAPLE

Leaves With three untoothed or slightly toothed leaflets, the central leaflet to 4 in (10 cm) long and 2½ in (6 cm) across, the lateral leaflets smaller and unequal-sided at the base, dark green and smooth above, blue-white and softly hairy beneath, turning red in autumn. ***Bark*** Gray-brown and smooth. ***Flowers*** Small and yellow, borne drooping in clusters of three, on downy stalks, in late spring at the same time as the young leaves emerge. ***Fruit*** With broad, spreading, green wings, to 2 in (5 cm) long.

• **NATIVE REGION** Japan.

• **HABITAT** By streams.

• **REMARK** Also known as *Acer nikoense*. The most notable feature of this species is its autumn color. The fruits, though attractive, rarely contain good seed.



Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer miyabei*	Author Maximowicz

ACER MIYABEI

Leaves Palmately lobed, to 5 in (13 cm) long, with three to five lobes, the larger lobes taper-pointed at the tip, each with few large, blunt teeth at the margin, heart-shaped at the base, bright green above, paler beneath, downy on both sides, more densely so beneath, turning yellow in autumn, carried on slender, red stalks; leaf stalk with milky juice when cut. ***Bark*** Gray-brown, corky, with shallow, orange-brown fissures, peeling in thin scales on old plants. ***Flowers*** Individually either male or male and female, small and yellow, borne drooping in slender-stalked clusters at the ends of short, leafy shoots, in spring at the same time as the young leaves emerge. ***Fruit*** With spreading or slightly curved wings, to 1 in (2.5 cm) long.

• **NATIVE REGION** Japan.

• **HABITAT** Woods.

Height 40 ft (12 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer negundo*	Author Linnaeus

BOX ELDER

Leaves Pinnate, with three to five or seven toothed, sometimes lobed leaflets, each borne on a slender rachis and ending in a long, tapered point, the terminal leaflet to 4 in (10 cm) long and 2½ in (6 cm) across, dark green and smooth above, smooth or downy beneath.
Bark Gray-brown and smooth.
Flowers Males and females both small, yellow-green, or pink in some forms, without petals, the females soon showing small, developing fruit wings, in hanging, tassel-like clusters, on separate plants in spring before or with the leaves. ***Fruit*** With down-pointing, curved wings, to 1½ in (4 cm) long, persisting on the plant during winter.
• **NATIVE REGION** North America.
• **HABITAT** Riverbanks, on moist soil.
• **REMARK** Also known as ash-leaved maple. The species is variable, and has several cultivated, ornamental forms.

tassel-like male flowers have long filaments

ACER NEGUNDO

red anthers

leaflets have broad yellow margin

'ELEGANS' ▷
The leaflets of this form have a distinctive yellow variegation.

leaflet margin is tinged pink

leaflets edged white

bronze young leaves

'FLAMINGO' ▷
The pink-tinged leaflets of this form are later margined with white.

deep pink leaf stalk

△ 'VARIEGATUM'
This variegated form has white-margined leaflets.

◁ VAR. VIOLACEUM
The attractive, bloomy shoots of this form later become purplish. The flowers are pink.

anthers hang on long, pink filaments

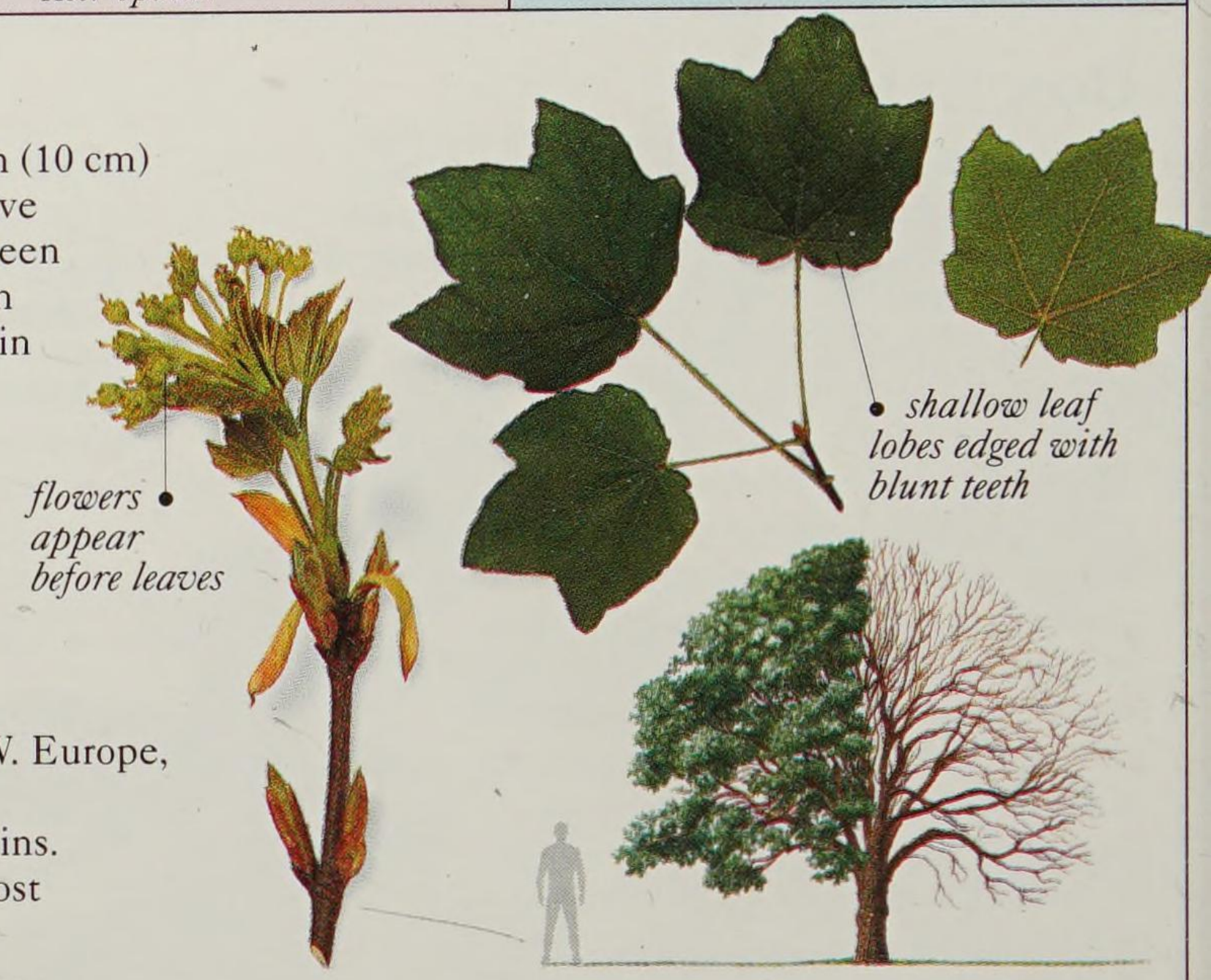
Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer opalus*	Author Miller

ITALIAN MAPLE

Leaves Palmately lobed, to 4 in (10 cm) long and across, with three to five bluntly toothed lobes, glossy green and smooth above, downy when young beneath, turning yellow in autumn. ***Bark*** Gray tinged pink, peeling in large, square plates. ***Flowers*** Small and bright yellow, opening on the bare shoots in early spring before the young leaves emerge. ***Fruit*** With wings, to 1½ in (4 cm) long.

• **NATIVE REGION** S. and W. Europe, from Italy to Spain.
• **HABITAT** Hills and mountains.
• **REMARK** This species is most beautiful when in flower.



Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer palmatum*	Author Thunberg

JAPANESE MAPLE

Leaves Rounded in outline, with five to seven deep, taper-pointed, sharply toothed lobes, to 4 in (10 cm) long and across, bright green, smooth, with tufts of hairs in the vein axils beneath, turning red, orange, or yellow in autumn. ***Bark*** Gray-brown, smooth. ***Flowers*** Small, red-purple, in upright to drooping clusters in spring as the young leaves emerge. ***Fruit*** With green or red wings, to ⅜ in (1 cm) long.

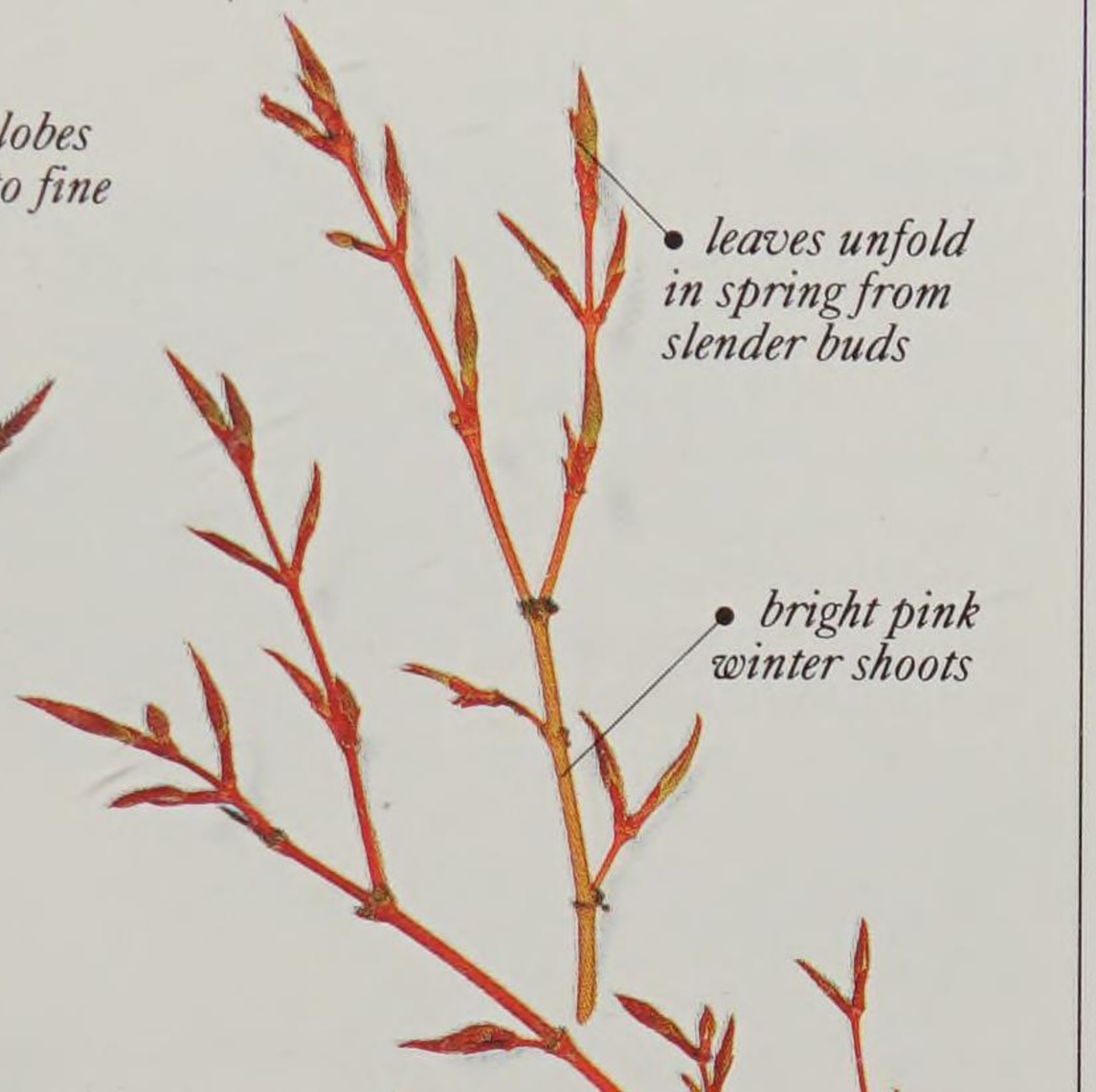
• **NATIVE REGION** China, Japan, Korea.
• **HABITAT** Thickets.
• **REMARK** The numerous, mainly shrubby, garden forms include dwarfs, and those with cut-leaved, colored, or variegated foliage.

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer palmatum*	Author Thunberg

leaf lobes taper to fine point

Δ 'ATROPURPUREUM'
This form is selected for its deep red-purple foliage, which turns brilliant red in autumn. It usually makes a smaller tree.



leaves unfold in spring from slender buds

bright pink winter shoots

Δ 'SENKAKI'

autumn coloration varies from yellow to shades of orange and brown

◁ 'SENKAKI'
Commonly known as coral-bark maple, this form has small leaves, which mature from orange-yellow to pale green, and turn bronze-yellow in autumn.

smaller, sharply lobed leaves crowded in dense masses

Δ'RIBESIFOLIUM'
This smaller form makes a compact plant, reaching about 16 ft (5 m).

purplish leaves very deeply cut into long, slender lobes

▷ 'LINEARILOBUM ATROPURPUREUM'
Spidery, red-purple leaves characterize this form. Its winged autumn fruits are tinged red, and hang in small clusters.

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer pensylvanicum*	Author Linnaeus

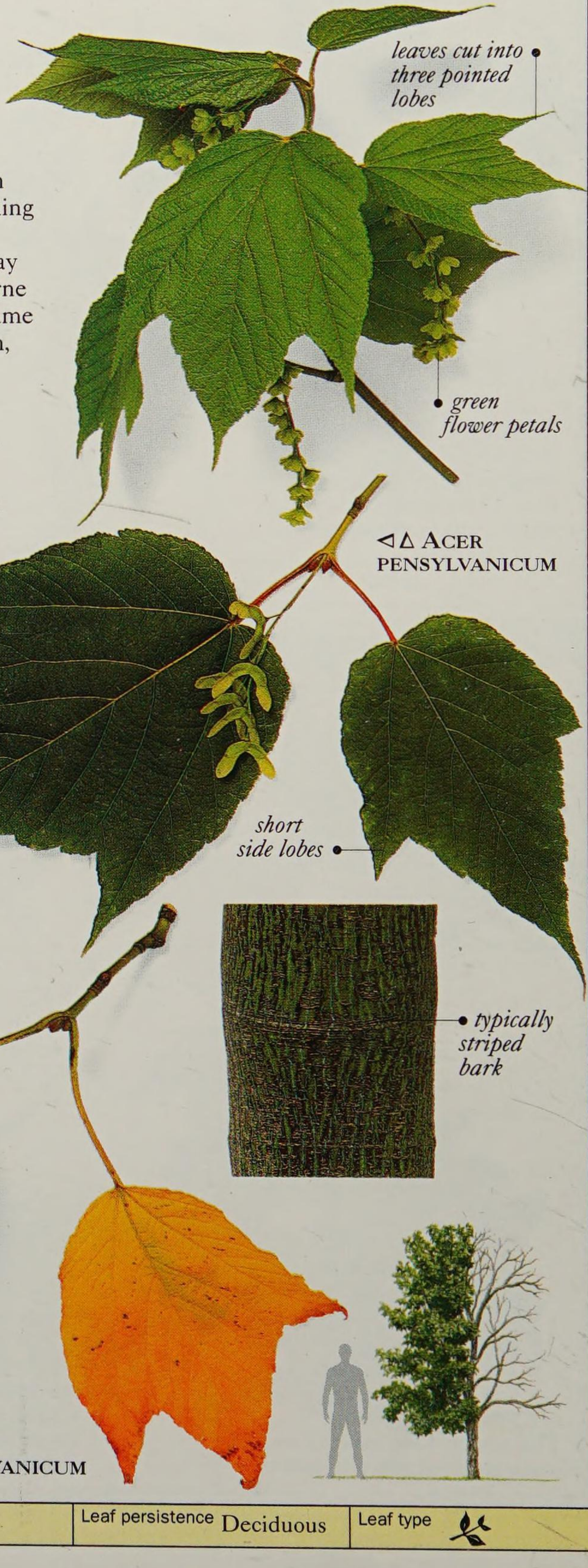
MOOSEWOOD

Leaves To 6 in (15 cm) or more long and nearly the same across, with three triangular, taper-pointed, toothed, forward-pointing lobes toward the end, deep yellow-green and smooth above, with red-brown hairs when young beneath, turning yellow in autumn. ***Bark*** Green, vertically striped red-brown and white, becoming gray with age. ***Flowers*** Small, yellow-green, borne in drooping racemes in late spring at the same time as the young leaves. ***Fruit*** With green, down-curved wings, to 1 in (2.5 cm) long.

• **NATIVE REGION** E. North America.

• **HABITAT** Moist woods.

• **REMARK** Also known as striped maple. This species is the only North American stripe-bark maple. The common name, moosewood, is given because moose eat the bark in winter.



◁△ ACER PENSYLVANICUM

◁ 'ERYTHROCLADUM' This form is distinguished by its bright pink young shoots and buds.

△ ACER PENSYLVANICUM

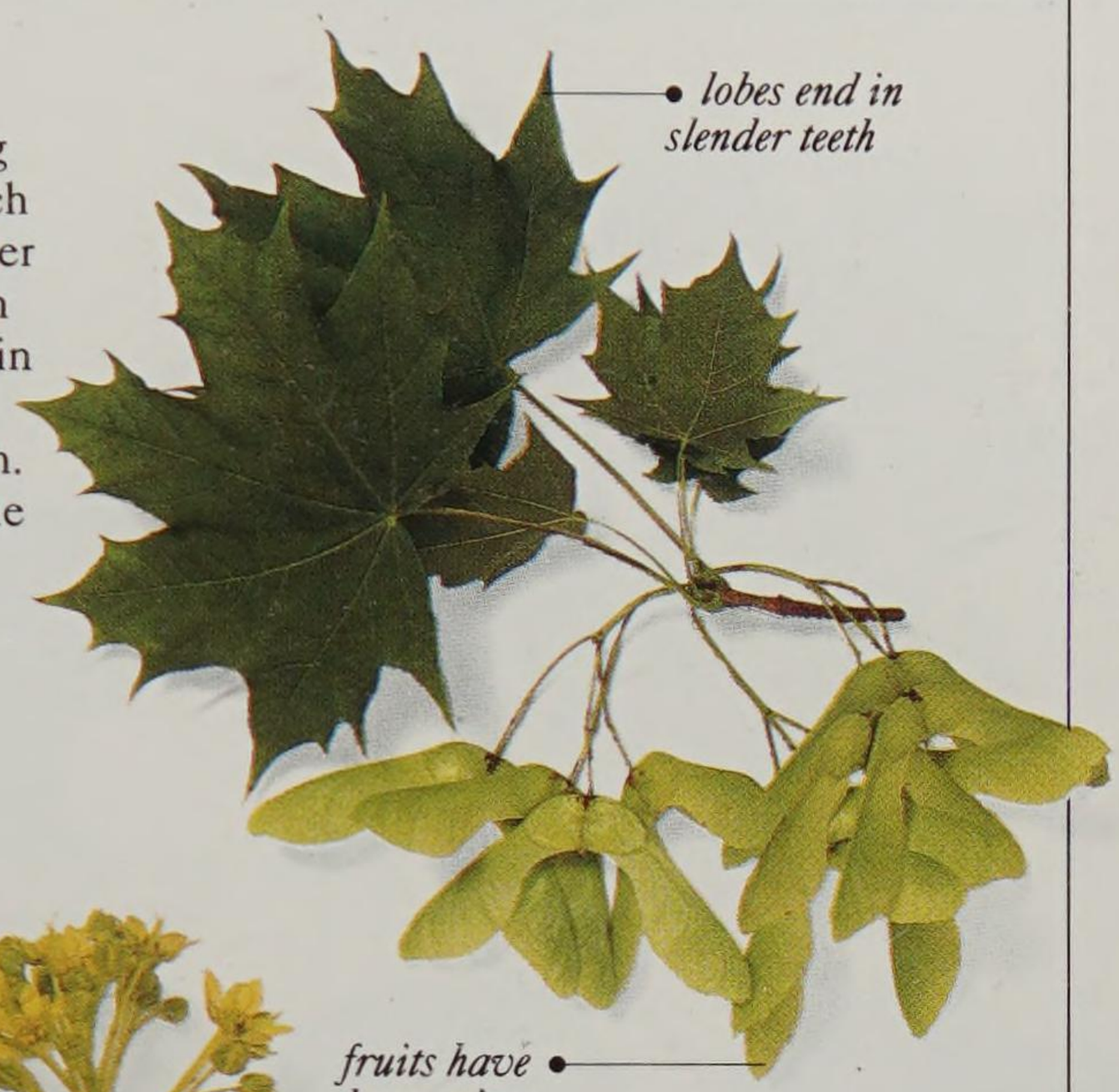
Height 26 ft (8 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer platanoides*	Author Linnaeus

NORWAY MAPLE

Leaves Palmately lobed, to 6 in (15 cm) long and 7 in (17.5 cm) across, with five lobes, each lobe ending in several teeth with long, slender points, bright green, smooth when mature on both sides, turning yellow or sometimes red in autumn; the long, slender leaf stalk exudes milky juice when cut. ***Bark*** Gray and smooth. ***Flowers*** Small and bright yellow-green, borne in conspicuous clusters in spring before and with the young leaves. ***Fruit*** With large, spreading wings, to 2 in (5 cm) long.

- **NATIVE REGION** S.W. Asia, Europe.
- **HABITAT** Mountain woods.
- **REMARK** A fast-growing species that quickly reaches its maximum height. In cultivation, it has many ornamental forms, selected for both foliage and habit.



◁ **ACER PLATANOIDES**

△ **ACER PLATANOIDES**

▽ **'CRIMSON KING'**
This form has deep red-purple leaves and red bud scales and flower stalks.

▽ **'CRIMSON SENTRY'**
The bright red young leaves of this form mature to deep purple-green. The tree has an upright habit.

Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer platanoides*	Author Linnaeus

∇ 'CUCULLATUM'
This form is selected for its unusual foliage. The leaves are fan-shaped, but end in downturned, twisted, clawlike lobes, which make the leaves appear almost distorted.

lobe ends turn under

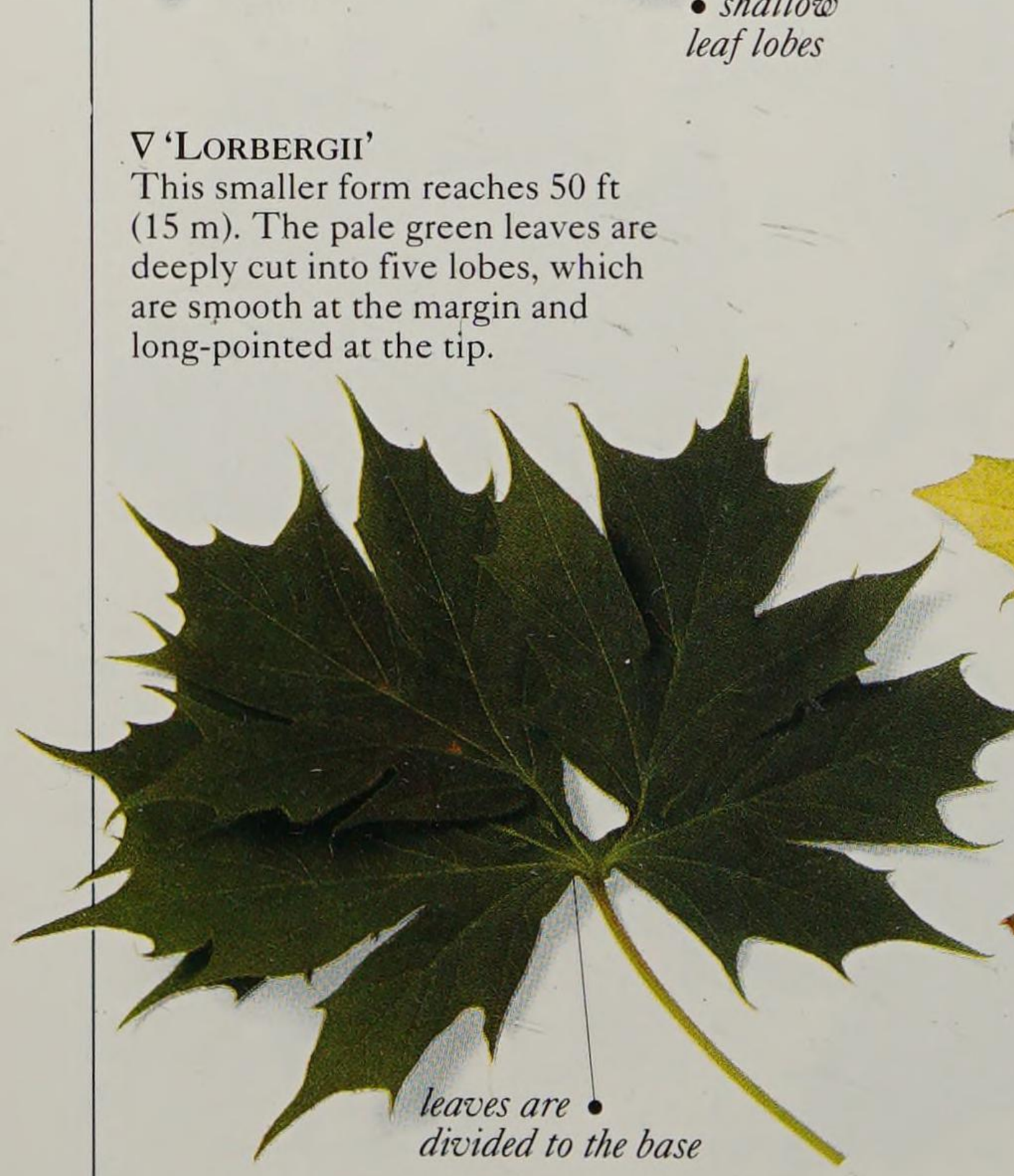
young leaves are purplish red

mature leaves are deep green

shallow leaf lobes

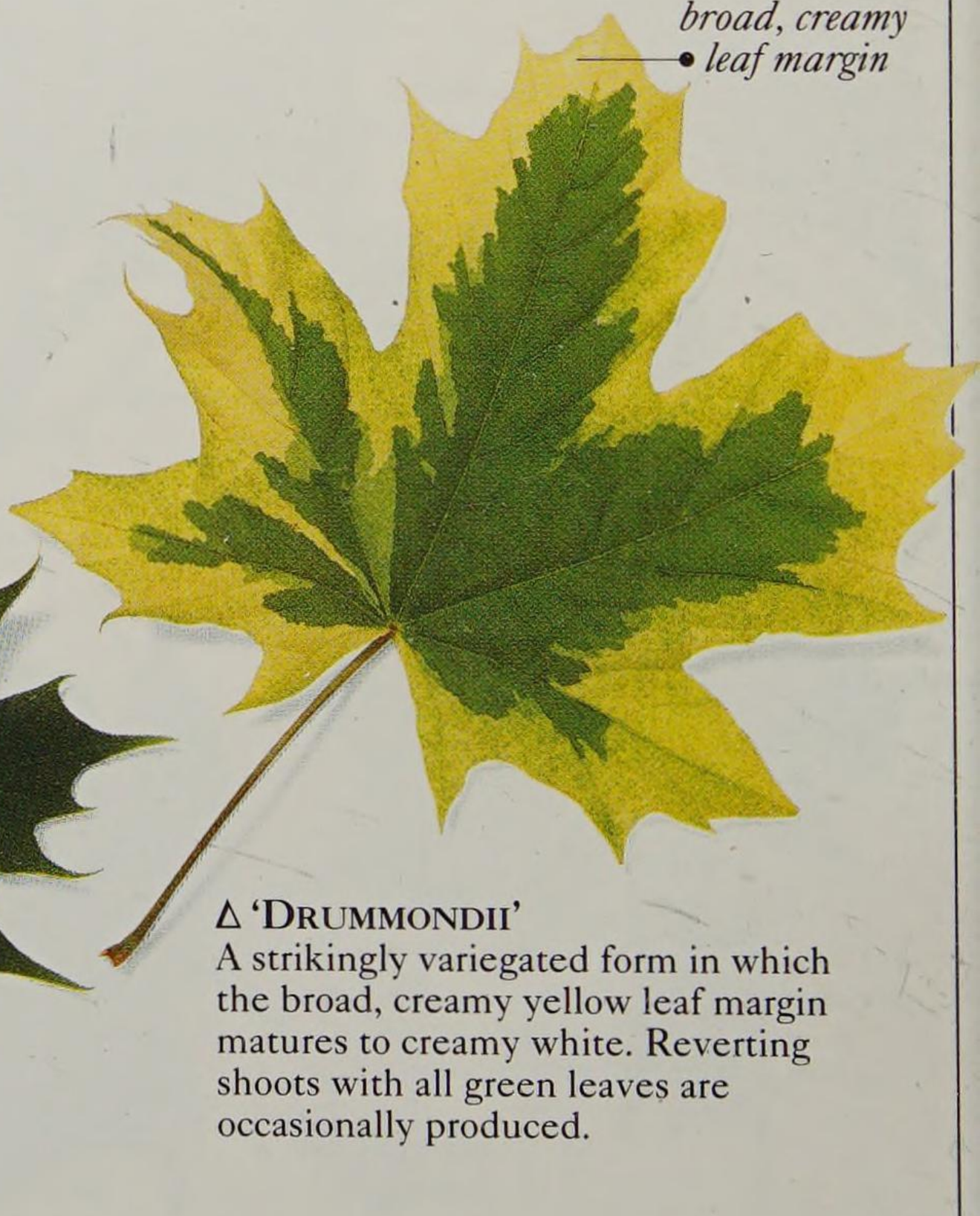
Δ 'DEBORAH'
The leaves of this form are colored red as they emerge and unfold, and later mature to dark green.

∇ 'LORBERGII'
This smaller form reaches 50 ft (15 m). The pale green leaves are deeply cut into five lobes, which are smooth at the margin and long-pointed at the tip.



leaves are divided to the base

broad, creamy leaf margin



Δ 'DRUMMONDII'
A strikingly variegated form in which the broad, creamy yellow leaf margin matures to creamy white. Reverting shoots with all green leaves are occasionally produced.

Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

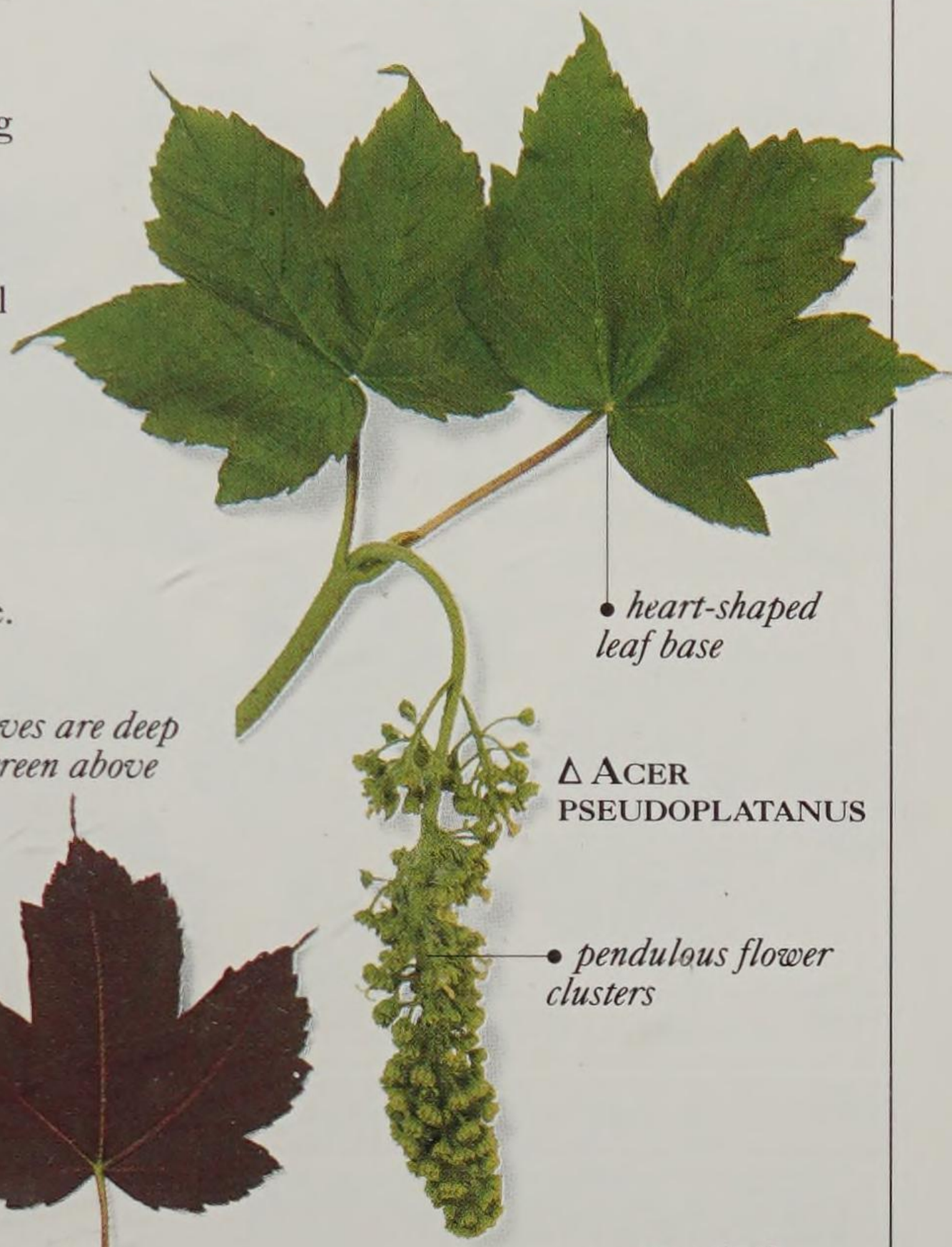
Family ACERACEAE	Species *Acer pseudoplatanus*	Author Linnaeus

SYCAMORE MAPLE

Leaves Palmately lobed, to 4¾ in (12 cm) long and 6 in (15 cm) across, with five coarsely toothed lobes, dark green and smooth above, blue-gray beneath. ***Bark*** Pinkish to yellowish gray, peeling in irregular plates. ***Flowers*** Small and yellow-green, without petals, in dense, hanging clusters in spring with the young leaves. ***Fruit*** With somewhat down-pointing wings, to 1 in (2.5 cm) long.

- **NATIVE REGION** S.W. Asia, Europe.
- **HABITAT** Deciduous mountain woods.
- **REMARK** In Scotland, also known as plane.

The species is widely naturalized in North America and Great Britain. In open sites, it may tend toward a spreading shape.



heart-shaped leaf base

pendulous flower clusters

Δ ACER PSEUDOPLATANUS

leaves are deep green above

fruit wings are bright red

Δ 'ATROPURPUREUM'
The special feature of this cultivar is the underside of the leaves, which is colored purple.

attractively colored young foliage

Δ F. ERYTHROCARPUM
The young fruits of this form have spectacular bright red wings.

variegation is striking

'BRILLIANTISSIMUM' Δ
The young leaves of this form are bright pink as they unfold, becoming whitish with green veins, maturing to yellow-green.

leaf underside is tinged purple

◁ 'NIZETII'
The leaves of this selection have bold blotches of pinkish white on the upper surface. The underside is purplish green.

Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer rubrum*	Author Linnaeus

RED MAPLE

Leaves To 4 in (10 cm) long and nearly the same across, with three or five toothed lobes, dark green and smooth above, blue-white with hairs on the veins beneath, turning red or yellow in autumn. ***Bark*** Dark gray and smooth. ***Flowers*** Small and red, on slender stalks, in dense clusters on the shoots in early spring. ***Fruit*** With red wings, about ¾ in (2 cm) long.

• **NATIVE REGION** E. North America.

• **HABITAT** Moist ground.

Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer rufinerve*	Author Siebold & Zuccarini

RUFINERVE MAPLE

Leaves To 5 in (13 cm) long and across, with usually three coarsely toothed lobes, dark green and smooth above, with rust-colored hairs on the veins beneath, turning red in autumn. ***Bark*** Dark green striped white and pale green, with diamond-shaped marks, gray and fissured with age. ***Flowers*** Small and yellow-green, in upright racemes in spring. ***Fruit*** With spreading wings, to ¾ in (2 cm) long.

• **NATIVE REGION** Japan.

• **HABITAT** Mountain woods.

Height 33 ft (10 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer saccharinum*	Author Linnaeus

SILVER MAPLE

Leaves Palmately lobed, to 6 in (15 cm) long and across, with five lobes, each itself lobed and sharply toothed, light green and smooth above, blue-white and thinly hairy beneath, usually turning yellow in autumn. ***Bark*** Gray, smooth, flaking with age. ***Flowers*** Males and females both small and greenish yellow, without petals, in clusters on the shoots in early spring. ***Fruit*** With spreading wings, to ¾ in (2 cm) long.

• **NATIVE REGION**
E. North America.

• **HABITAT** Moist soil and riverbanks.

Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer saccharum*	Author Marshall

SUGAR MAPLE

Leaves Palmately lobed, to 5 in (13 cm) long and slightly more across, with five lobes, the three largest with few prominent teeth, heart-shaped at the base, mid- to dark green above, with hairs in the vein axils beneath, turning yellow to orange or red in autumn. ***Bark*** Gray-brown, smooth, becoming furrowed and scaly with age. ***Flowers*** Small, yellow-green, without petals, drooping on slender stalks, in open clusters in spring with the young leaves. ***Fruit*** With nearly parallel wings, to 1 in (2.5 cm) long.

• **NATIVE REGION**
E. North America.

• **HABITAT** Rich woods.

• **REMARK** Also known as rock maple. The sap is processed into maple syrup.

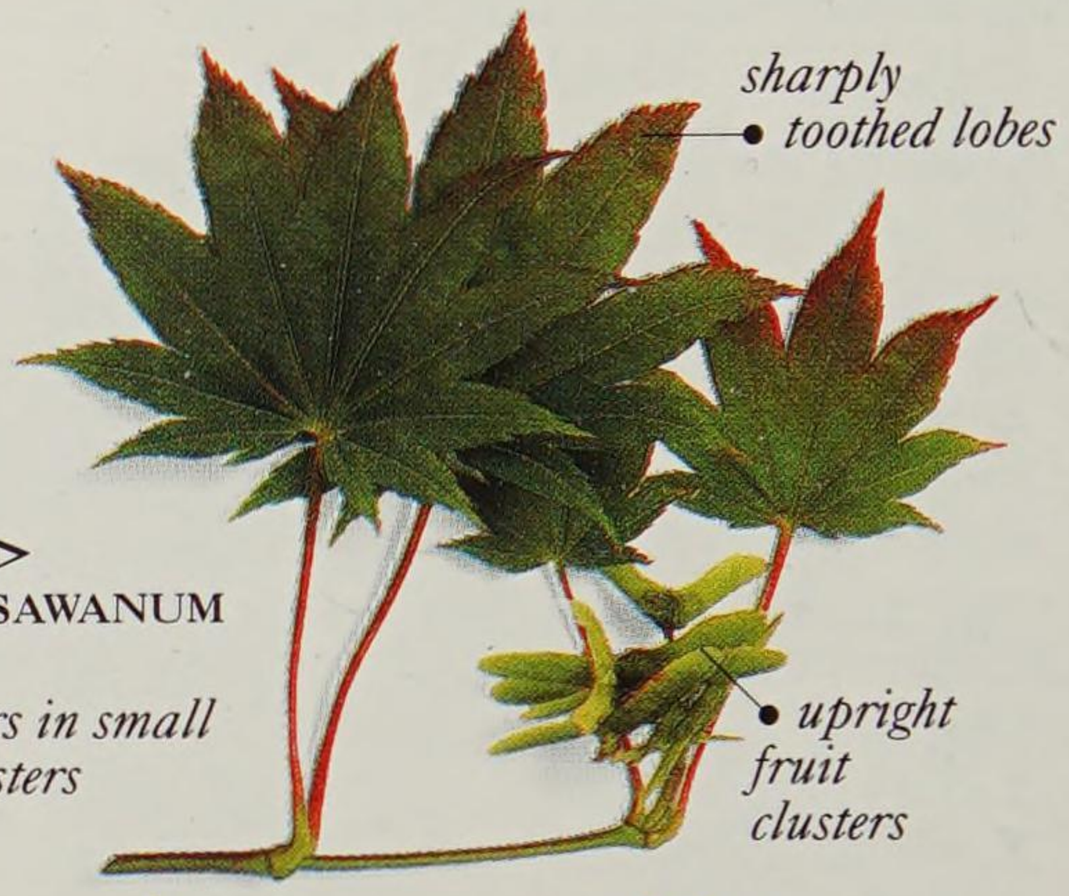
Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer shirasawanum*	Author Koidzumi

ACER SHIRASAWANUM

Leaves Rounded in outline, to 4¾ in (12 cm) long and across, with about 11 sharply toothed lobes, bright green above, smooth on both sides, turning orange and red in autumn. ***Bark*** Gray-brown and smooth. ***Flowers*** Small, with a pink calyx and cream sepals, in spreading to upright clusters in spring with the leaves. ***Fruit*** With widely spreading wings, in upright clusters.

- **NATIVE REGION** Japan.
- **HABITAT** Mountain slopes and valleys.
- **REMARK** This species is often confused with the full-moon maple *(Acer japonicum*, see p.90), to which it is related.



ACER ▷ SHIRASAWANUM

◁ 'AUREUM'
This form has golden yellow foliage.

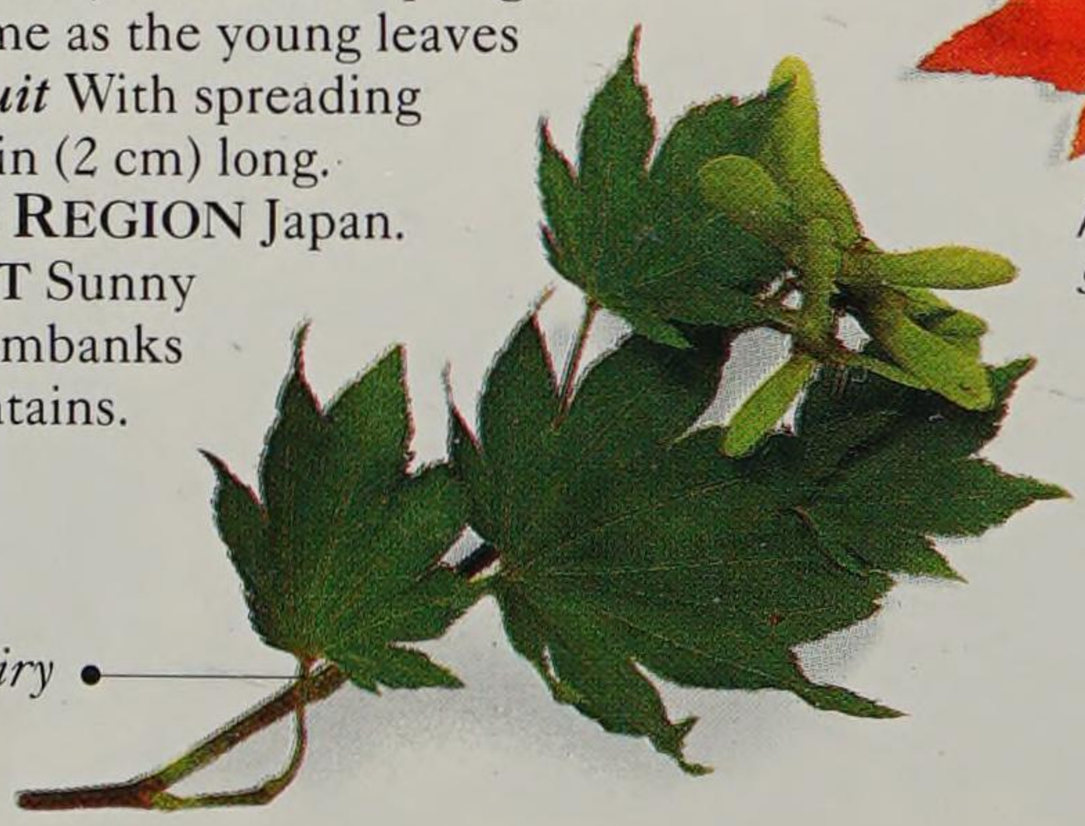
Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer sieboldianum*	Author Miquel

ACER SIEBOLDIANUM

Leaves Rounded in outline, to 3 in (7.5 cm) long and the same across, with seven to nine or sometimes eleven taper-pointed, sharply toothed lobes, cut nearly to the middle, pale green, covered in white hairs when young becoming dark green above, downy beneath, turning red in autumn, on downy stalks. ***Bark*** Dark gray-brown and smooth. ***Flowers*** Small, with yellow petals and purplish sepals, in long-stalked, drooping, downy clusters in spring at the same time as the young leaves emerge. ***Fruit*** With spreading wings, to ¾ in (2 cm) long.

- **NATIVE REGION** Japan.
- **HABITAT** Sunny ridges, streambanks in the mountains.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer spicatum*	Author Lamarck

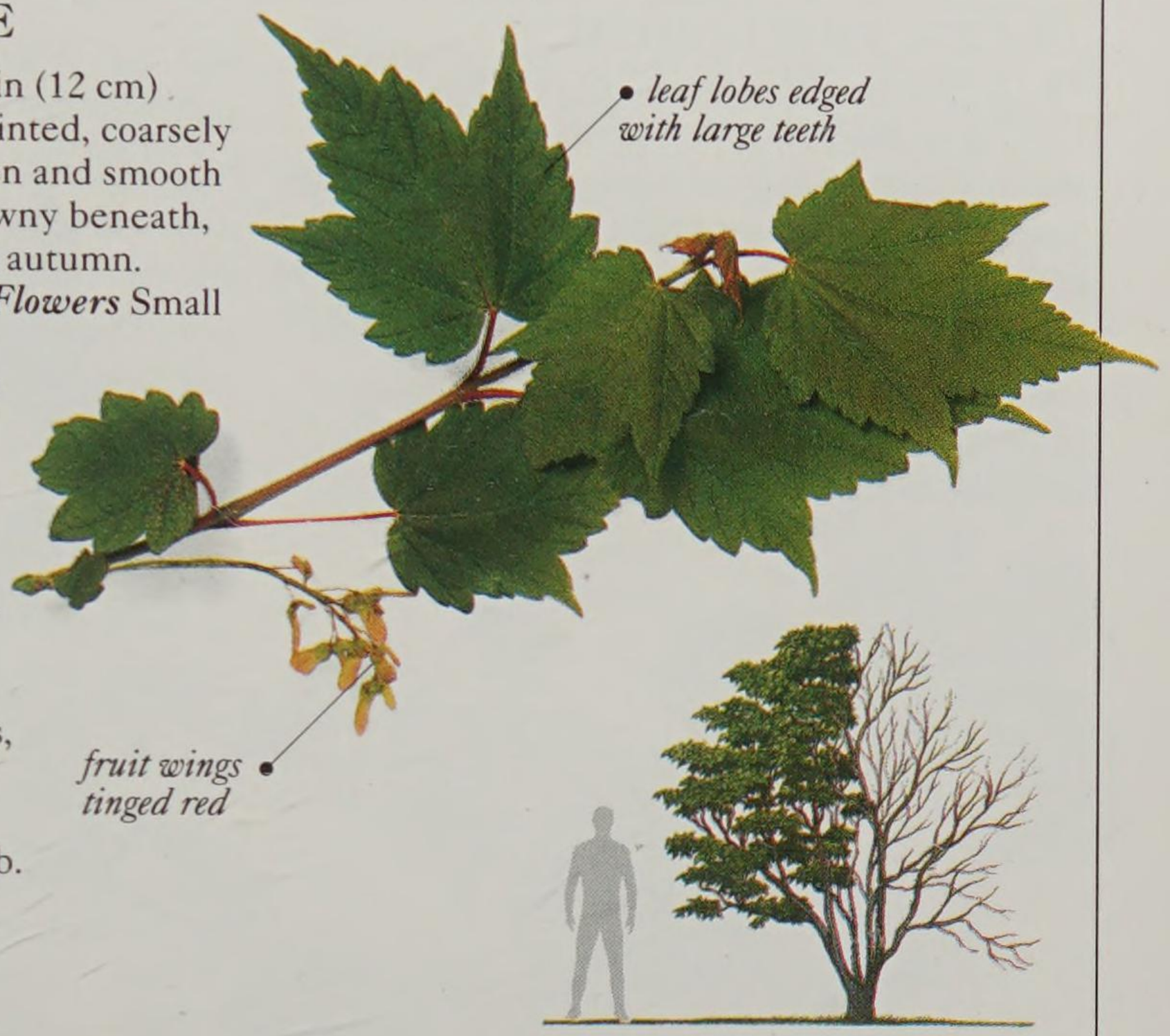
MOUNTAIN MAPLE

Leaves Palmately lobed, to 4¾ in (12 cm) long, with three or five taper-pointed, coarsely toothed lobes, deep yellow-green and smooth with impressed veins above, downy beneath, turning yellow, orange, or red in autumn. ***Bark*** Gray-brown and smooth. ***Flowers*** Small and greenish white, numerous, borne in dense, slender, upright panicles to 6 in (15 cm) long, in early summer. ***Fruit*** With wings spreading at about a right angle, to 1 in (2.5 cm) long, green often becoming red.

• **NATIVE REGION**
E. North America.

• **HABITAT** Cool, moist woods, usually in mountains.

• **REMARK** Can be either a small, bushy tree or a large shrub. It is widely distributed in its habitat. A number of related species are native to E. Asia.



Height 26 ft (8 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer trautvetteri*	Author Medwedew

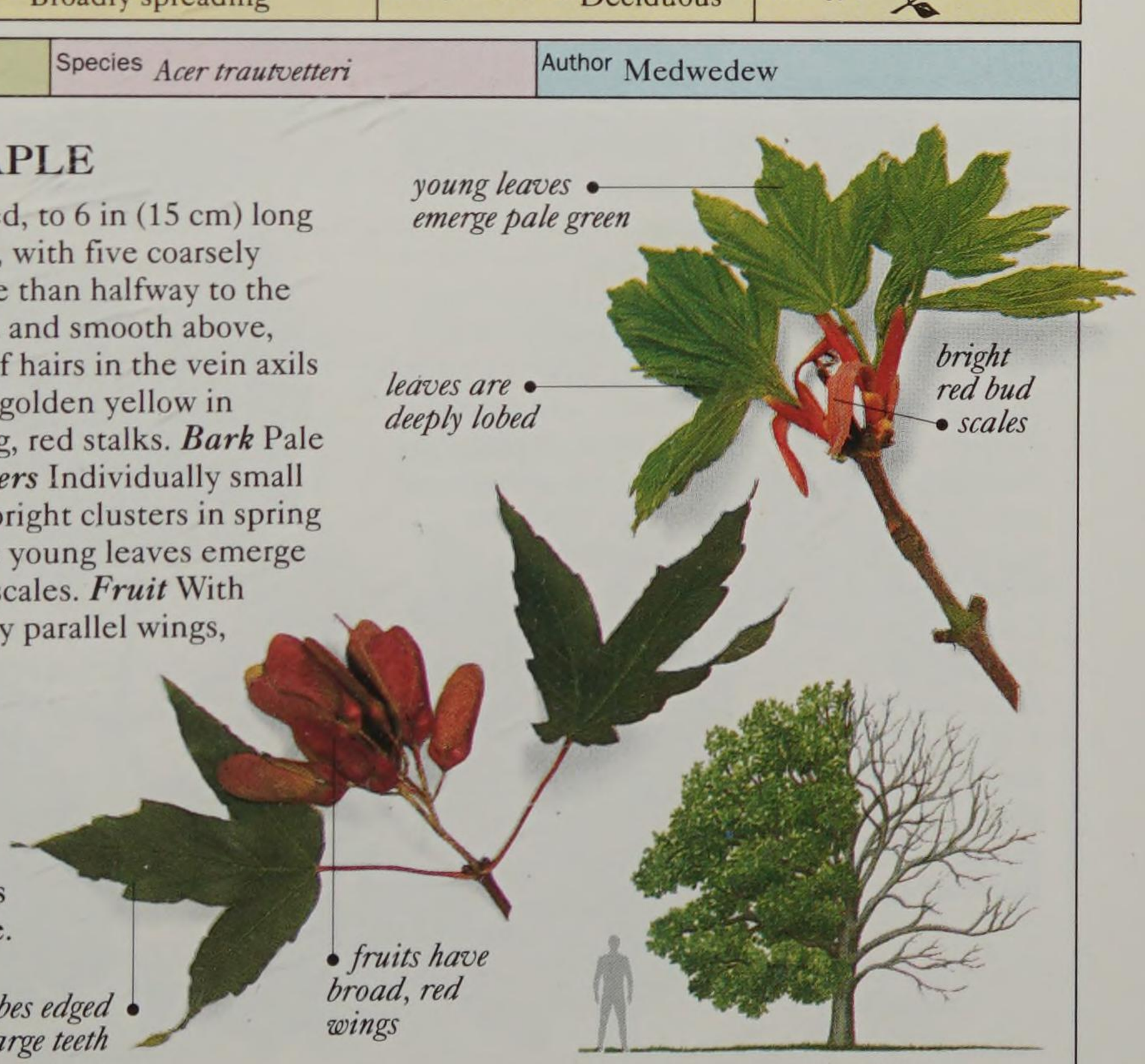
RED-BUD MAPLE

Leaves Palmately lobed, to 6 in (15 cm) long and 8 in (20 cm) across, with five coarsely toothed lobes, cut more than halfway to the base, glossy dark green and smooth above, blue-green with tufts of hairs in the vein axils beneath, turning deep golden yellow in autumn, carried on long, red stalks. ***Bark*** Pale gray and smooth. ***Flowers*** Individually small and yellow, borne in upright clusters in spring at the same time as the young leaves emerge among bright red bud scales. ***Fruit*** With broad, bright red, nearly parallel wings, to 2 in (5 cm) long.

• **NATIVE REGION**
S.W. Asia, Caucasus.

• **HABITAT** Mixed deciduous and evergreen forests.

• **REMARK** The fruits are an attractive feature.



Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

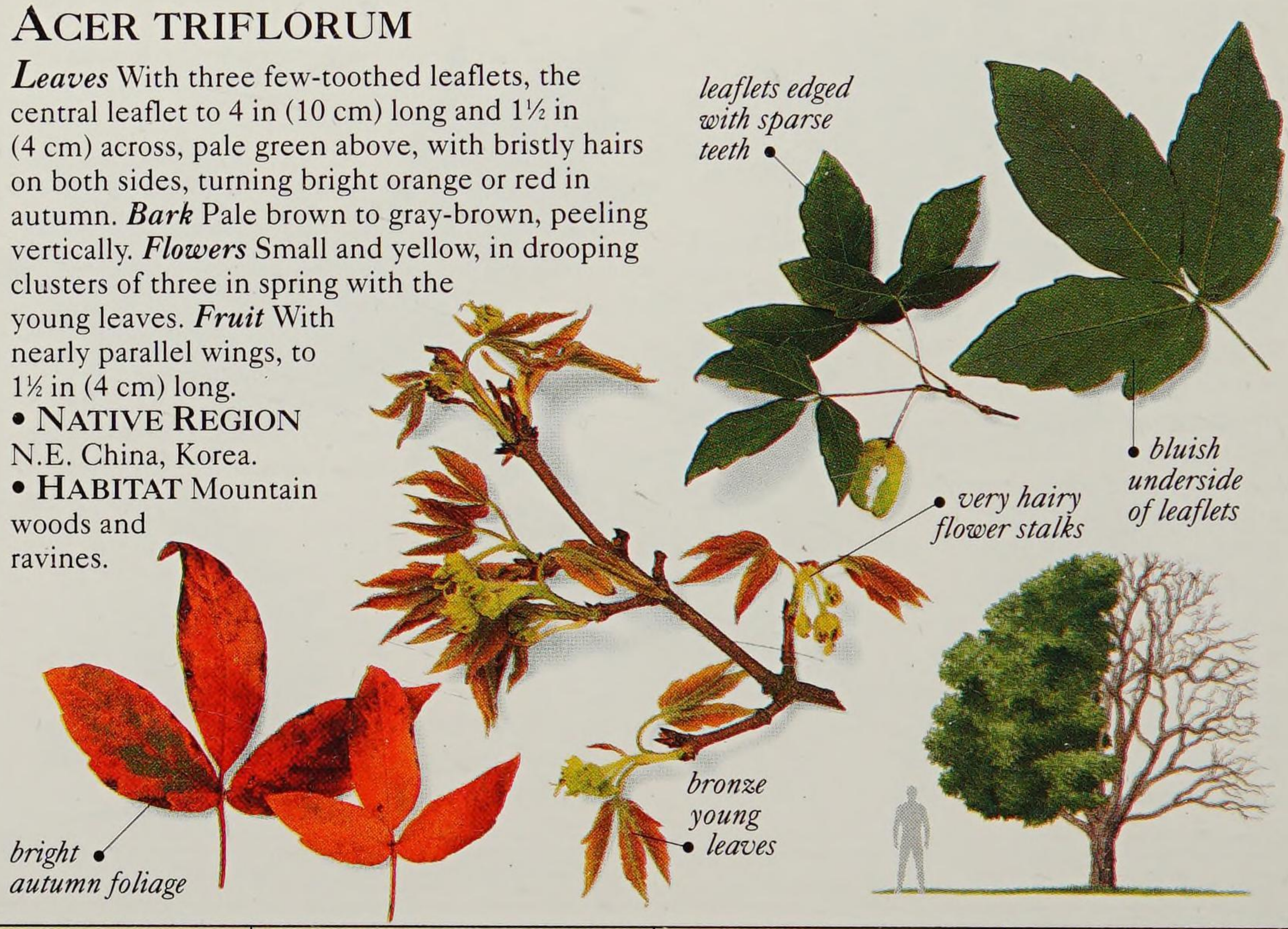
Family ACERACEAE	Species *Acer triflorum*	Author Komarov

ACER TRIFLORUM

Leaves With three few-toothed leaflets, the central leaflet to 4 in (10 cm) long and 1½ in (4 cm) across, pale green above, with bristly hairs on both sides, turning bright orange or red in autumn. ***Bark*** Pale brown to gray-brown, peeling vertically. ***Flowers*** Small and yellow, in drooping clusters of three in spring with the young leaves. ***Fruit*** With nearly parallel wings, to 1½ in (4 cm) long.

• **NATIVE REGION**
N.E. China, Korea.

• **HABITAT** Mountain woods and ravines.



Height 40 ft (12 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ACERACEAE	Species *Acer velutinum*	Author Boissier

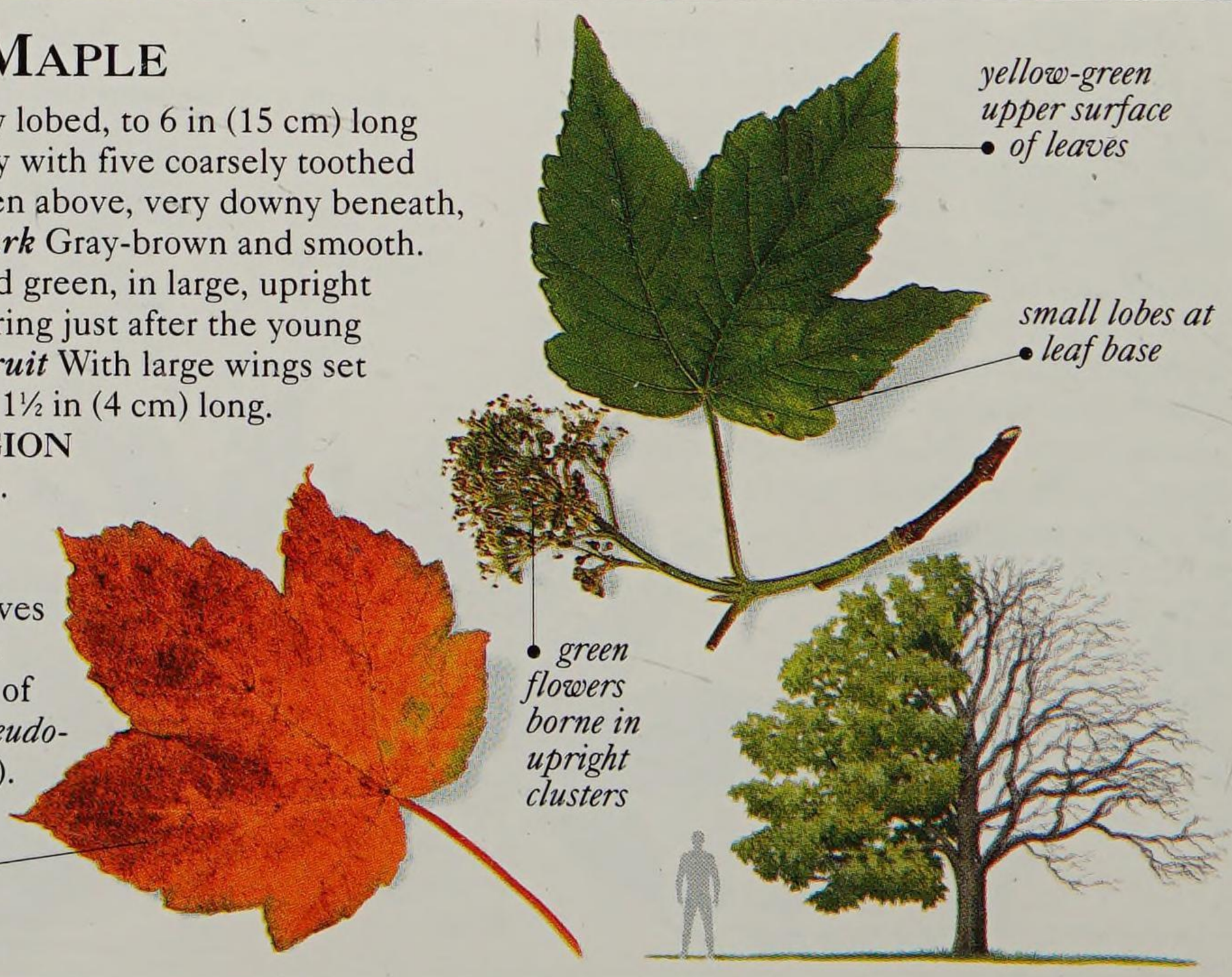
PERSIAN MAPLE

Leaves Palmately lobed, to 6 in (15 cm) long and across, usually with five coarsely toothed lobes; yellow-green above, very downy beneath, on long stalks. ***Bark*** Gray-brown and smooth. ***Flowers*** Small and green, in large, upright clusters in late spring just after the young leaves emerge. ***Fruit*** With large wings set at right angles, to 1½ in (4 cm) long.

• **NATIVE REGION**
Caucasus, N. Iran.

• **HABITAT**
Mountain woods.

• **REMARK** Leaves are similar to, but larger than, those of sycamore *(Acer pseudo-platanus*, see p.99).



Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

ANACARDIACEAE

WITH A WIDE DISTRIBUTION in the warm regions of the world, this family contains over 800 species of evergreen and deciduous trees, shrubs, and climbing plants, collected in 80 genera. The leaves are nearly always alternate and are pinnate or simple. Small male and female flowers are sometimes borne on separate plants. The foliage often contains a skin-irritating resin. Other family members include the cashew nut *(Anacardium occidentale)*, mango *(Mangifera indica)*, and poison ivy *(Rhus radicans)*.

Family ANACARDIACEAE	Species *Cotinus obovatus*	Author Rafinesque

AMERICAN SMOKE TREE

Leaves Obovate, to 6 in (15 cm) long and 3 in (7.5 cm) across, thin, untoothed, bronze when young becoming blue-green, smooth above, hairy beneath, turning brilliant yellow to orange and red in autumn. ***Bark*** Gray-brown, becoming scaly with age. ***Flowers*** Males and females both small and yellow, in long, conical clusters at the ends of the shoots, usually on separate plants in early summer. ***Fruit*** Individually small, clustered together, with numerous, slender, feathery flower stalks.

• **NATIVE REGION**
C. and S. United States.

• **HABITAT** Rocky hills.

Height 33 ft (10 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

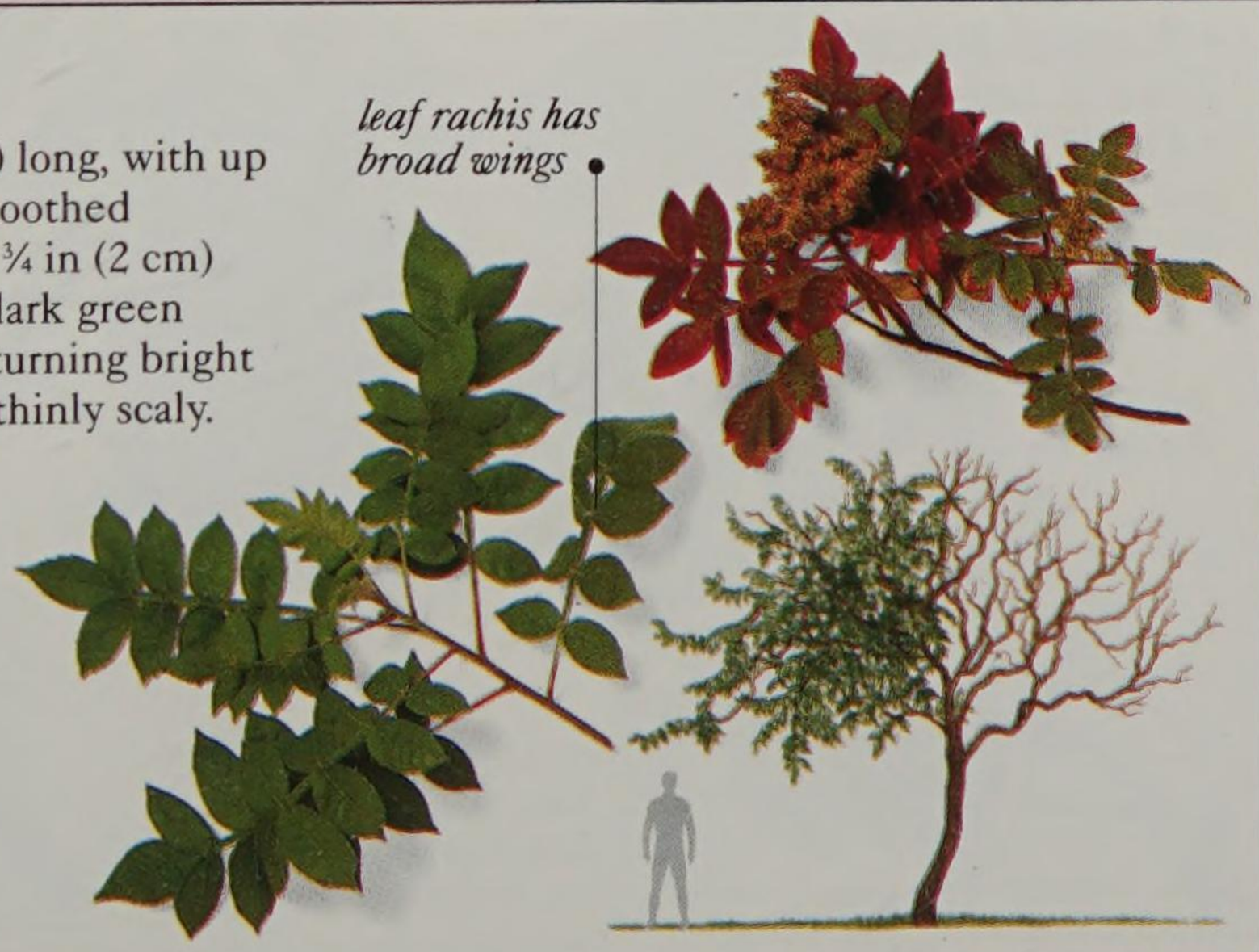
Family ANACARDIACEAE	Species *Rhus copallina*	Author Linnaeus

SHINY SUMAC

Leaves Pinnate, to 14 in (35 cm) long, with up to 23 oblong, narrow, usually untoothed leaflets, to 4 in (10 cm) long and ¾ in (2 cm) across, downy becoming glossy dark green above, paler and hairy beneath, turning bright red in autumn. ***Bark*** Dark gray, thinly scaly. ***Flowers*** Small, yellowish, in dense, conical clusters at the ends of the shoots in summer. ***Fruit*** Small, densely packed into a conical, bright red cluster, to 8 in (20 cm) long.

• **NATIVE REGION**
E. North America.

• **HABITAT** Mountains, woods, and scrub, on dry soil.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

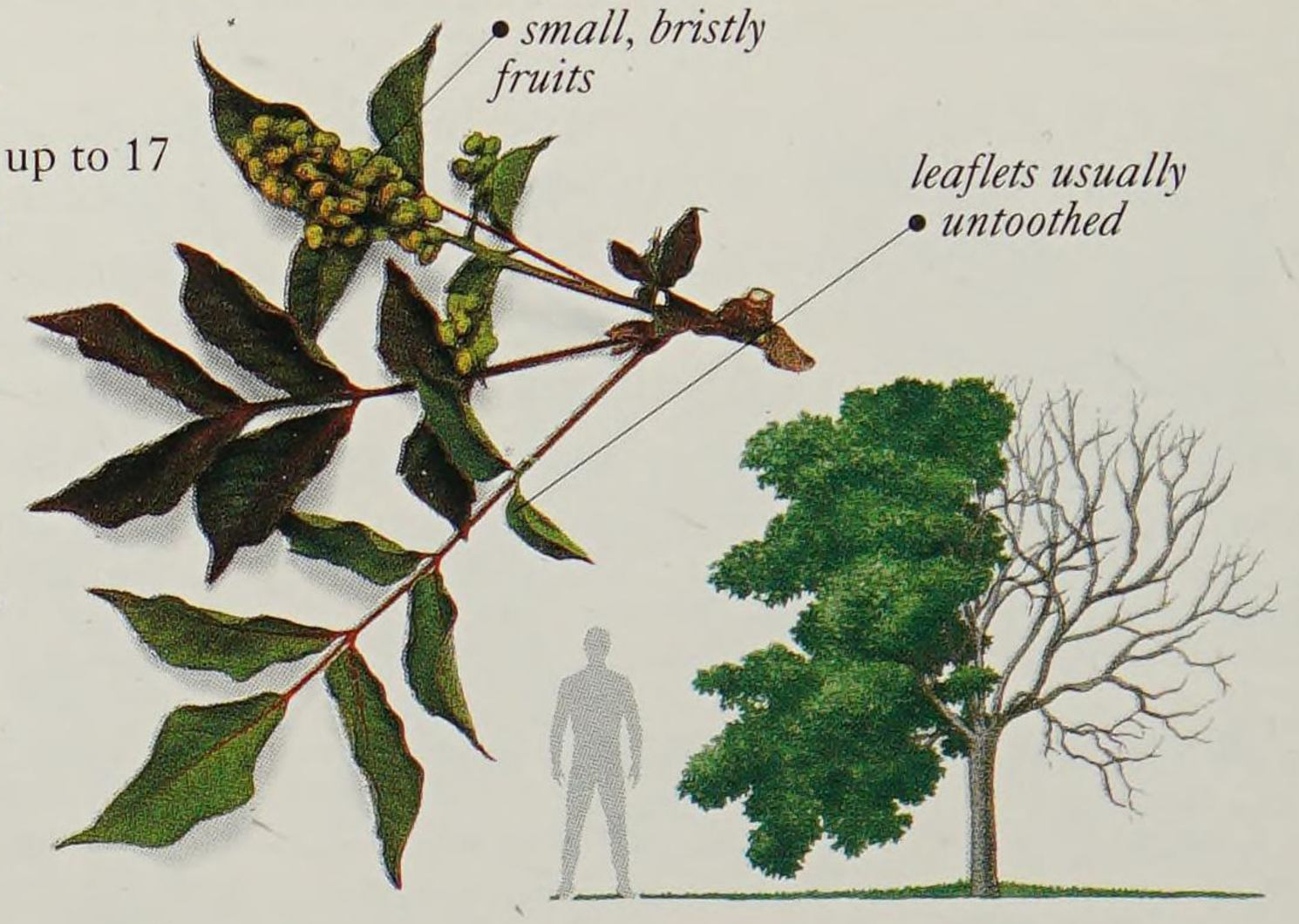
Family ANACARDIACEAE	Species *Rhus trichocarpa*	Author Miquel

RHUS TRICHOCARPA

Leaves To 20 in (50 cm) long, with up to 17 ovate, taper-pointed leaflets, to 4 in (10 cm) long and 1½ in (4 cm) across, reddish becoming matte dark green, downy, turning orange-red in autumn. ***Bark*** Pale gray-brown, with conspicuous lenticels. ***Flowers*** Tiny, yellowish, in conical panicles in the leaf axils in summer. ***Fruit*** Small, brownish yellow.

• **NATIVE REGION** China, Japan, Korea.

• **HABITAT** Mountain and roadside thickets.



Height 26 ft (8 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ANACARDIACEAE	Species *Rhus typhina*	Author Linnaeus

STAGHORN SUMAC

Leaves To 24 in (60 cm) long, with up to 27 lanceolate to oblong, sharply toothed leaflets, to 4¾ in (12 cm) long and 2 in (5 cm) across, dark green above, blue-green beneath, downy on both sides when young becoming nearly smooth, turning bright orange and red in autumn, on stout, velvety shoots. ***Bark*** Dark brown and smooth. ***Flowers*** Males and females both small and green, in dense, conical clusters at the ends of the shoots, on the same plant or on separate plants in summer. ***Fruit*** Small, bright red, in a dense, conical cluster, to 8 in (20 cm) long.

• **NATIVE REGION** E. North America.

• **HABITAT** Meadows, scrub, and wood margins, often on dry, rocky soil.

◁ **RHUS TYPHINA**

◁ **'DISSECTA'** This ornamental form has finely cut leaflets.

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

ANNONACEAE

A MAINLY TROPICAL FAMILY, with more than 2,000 species, related to the magnolias *(Magnolia*, see pp.202–215). The trees typically have simple, alternate leaves, and flowers with the petals arranged in whorls of three. The custard apples *(Annona)* are well-known members of the family.

Family ANNONACEAE	Species *Asimina triloba*	Author (Linnaeus) Dunal

PAWPAW

Leaves Oblong to obovate, to 10 in (25 cm) long, taper-pointed at the tip, untoothed, rather pale green, downy when young becoming smooth beneath, turning yellow in autumn. ***Bark*** Gray-brown, becoming somewhat rough and scaly with age. ***Flowers*** To 1½ in (4 cm) across, green at first becoming purple-brown, with six petals, the inner three upright, the outer three larger and spreading, borne singly on short, stout stalks on the old shoots in late spring as the young leaves emerge. ***Fruit*** Fleshy and edible, to 6 in (15 cm) long, green at first becoming yellow-brown when ripe.

• **NATIVE REGION**
E. North America.

• **HABITAT** Rich, moist woods.

• **REMARK** The flavor of the unusual fruits may be likened to that of bananas. This species is often confused with *Carica papaya*, a tropical tree grown for its edible fruits, and also known by the common name pawpaw.

Height 30 ft (9 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

AQUIFOLIACEAE

A FAMILY OF WIDE DISTRIBUTION in temperate and tropical regions, comprising over 700 evergreen and deciduous species, almost all of which are hollies *(Ilex)*. The trees and shrubs usually have alternate leaves. Male and female flowers are small, white or pink, borne on separate plants; females develop in autumn into yellow, red, orange, or black berries. The leaves of *Ilex paraguariensis*, a South American species, are used for yerba maté tea.

Family AQUIFOLIACEAE	Species *Ilex* x *altaclerensis*	Author (hort. ex Loudon) Dallimore

HIGHCLERE HOLLY

Leaves Variable in size and shape, oblong to ovate or nearly rounded, to 5 in (13 cm) or more long and 3 in (7.5 cm) across, spine-tipped and often with a spiny margin, glossy dark green above. ***Bark*** Gray and smooth. ***Flowers*** Males and females both small and white, usually tinged purple, fragrant, in clusters in the leaf axils, borne on separate plants in spring.
Fruit A large, fleshy, red berry.

• **NATIVE REGION** Of garden origin.

• **REMARK** A hybrid between the common holly *(Ilex aquifolium*, see p.109) and *Ilex perado*, a species native to the Canary Islands, Madeira, and the Azores. This hybrid is recognized mainly as named cultivars and appears in many ornamental forms.

◁ 'BELGICA AUREA'
The long leaves of this female plant have few spines.

reddish purple leaf stalks

creamy yellow leaf margin

deeply veined leaves

'GOLDEN KING' △
The broad, thick leaves of this female plant have a bold, yellow margin.

△ 'CAMELLIIFOLIA'
A female plant, with nearly spineless leaves, purple when young.

red-tinged buds open into white flowers

'LAWSONIANA' ▷
The yellow-splashed leaves of this female plant have a nearly spineless margin.

glossy, dark leaves

△ 'HODGINSII'
A male plant, with large, few-spined, dark green leaves and purple shoots.

◁ 'WILSONII'
This female plant has large leaves.

irregularly blotched yellow and green marks on leaves

Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family AQUIFOLIACEAE	Species *Ilex aquifolium*	Author Linnaeus

ENGLISH HOLLY

Leaves Variable, elliptic to ovate, to 4 in (10 cm) long and 2 in (5 cm) across, spine-tipped, juveniles on lower part of plant with a very spiny margin, adults with a more or less spineless margin, glossy dark green above. ***Bark*** Pale gray and smooth. ***Flowers*** Males and females small and white or purple-tinged, fragrant, in clusters in the leaf axils, usually on separate plants in late spring. ***Fruit*** A usually red berry, to ⅜ in (1 cm) across.

• **NATIVE REGION**
W. Asia, Europe.

• **HABITAT** Woods, particularly those of beech and oak.

• **REMARK** This species has given rise to numerous variations in both leaf and fruit.

▽ ILEX AQUIFOLIUM

female flowers have prominent green ovary

male flowers

◁ ILEX AQUIFOLIUM

leaves both with and without spines

◁ ILEX AQUIFOLIUM

red, densely clustered berries

'CRISPA AUREA PICTA' ▷
The thick, often twisted, leaves of this male form are spineless, except at the tip, and have a central yellow and pale green blotch.

spine emerges from indented leaf tip

▽ 'ARGENTEA MARGINATA'
This female plant has pink young leaves, green shoots, and red berries.

spiny leaves have creamy white margin

berries borne abundantly

◁ 'FEROX'
The spines on the upper surface of the leaves give this male plant its common name, hedgehog holly.

'BACCIFLAVA' Δ
This handsome cultivar bears yellow berries and has spiny leaves.

pale spines on upper leaf surface

Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family AQUIFOLIACEAE	Species *Ilex aquifolium*	Author Linnaeus

creamy spines on leaf surface and at margin

leaves may be irregularly spined

glossy green surface either side of leaf midrib

∇ 'FLAVESCENS'
The moonlight holly, a female plant, has leaves flushed yellow. The leaf stalk and midrib are also yellow.

Δ 'FEROX ARGENTEA'
The leaves of this male cultivar have a creamy yellow to white margin. The tree is commonly known as silver hedgehog holly.

leaves may have smooth margin

leaf margin may be tinged pink

red berries borne in abundance

deeply impressed leaf veins

◁ 'J.C. VAN TOL'
This is a female plant. Its thick leaves are glossy dark green and smooth above and have few spines or none at all.

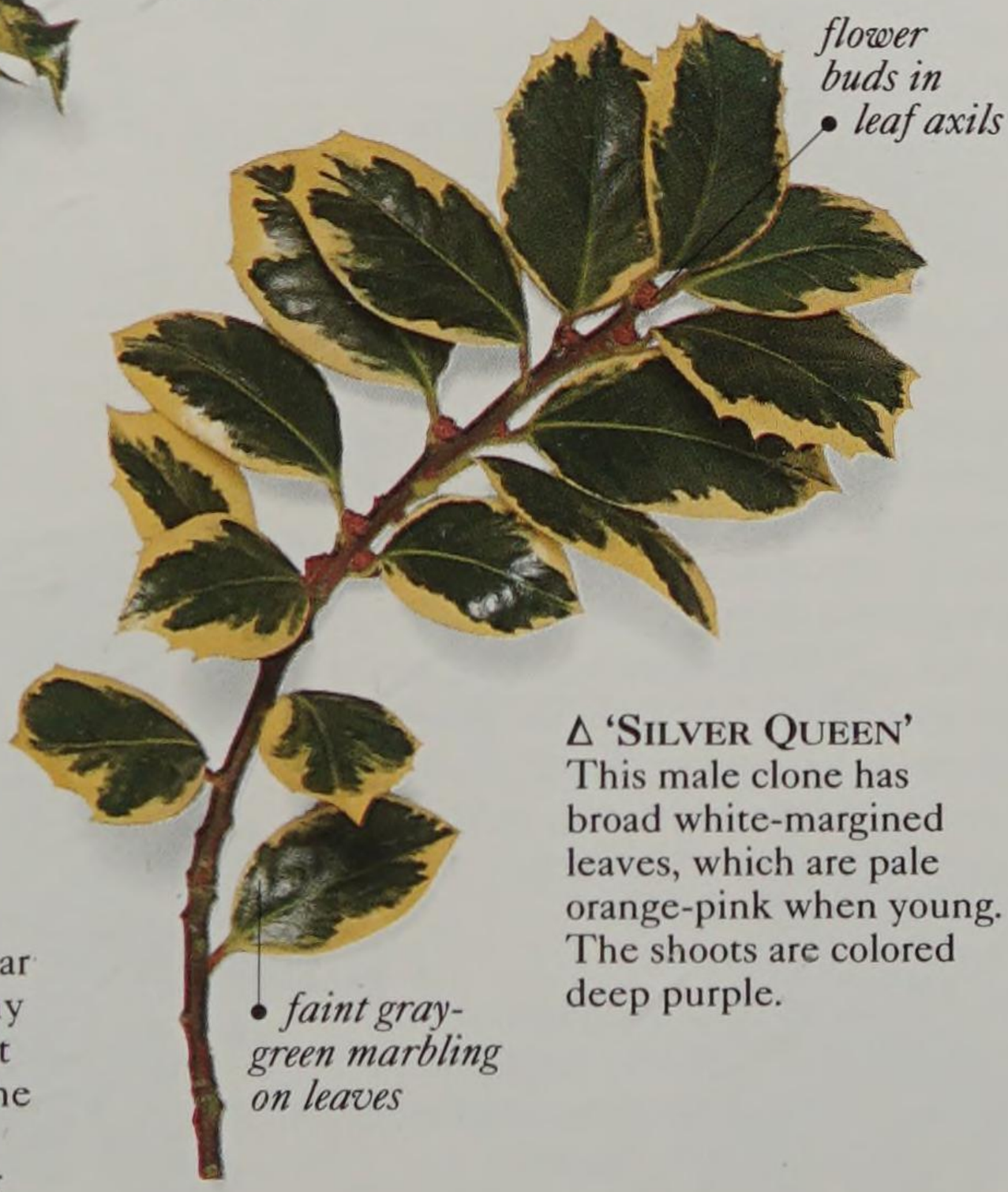
Δ 'HANDSWORTH NEW SILVER'
Purple stems, white-margined leaves, and small red berries characterize this female form.

Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family AQUIFOLIACEAE	Species *Ilex aquifolium*	Author Linnaeus

'MADAME BRIOT' ▷
The leaves of this bushy female form are broad and have a dark yellow margin. The tree bears scarlet berries in autumn.

Δ 'PYRAMIDALIS FRUCTU LUTEO'
The oval, glossy green, often spineless, leaves of this female plant contrast well with the abundant yellow berries.



Δ 'SILVER MILKMAID'
The leaves of this old cultivar are dark green, with a creamy white blotch in the center. It has red berries. In spite of the inappropriate name, plants that were once called 'Silver Milkboy' are also female.

Δ 'SILVER QUEEN'
This male clone has broad white-margined leaves, which are pale orange-pink when young. The shoots are colored deep purple.

Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

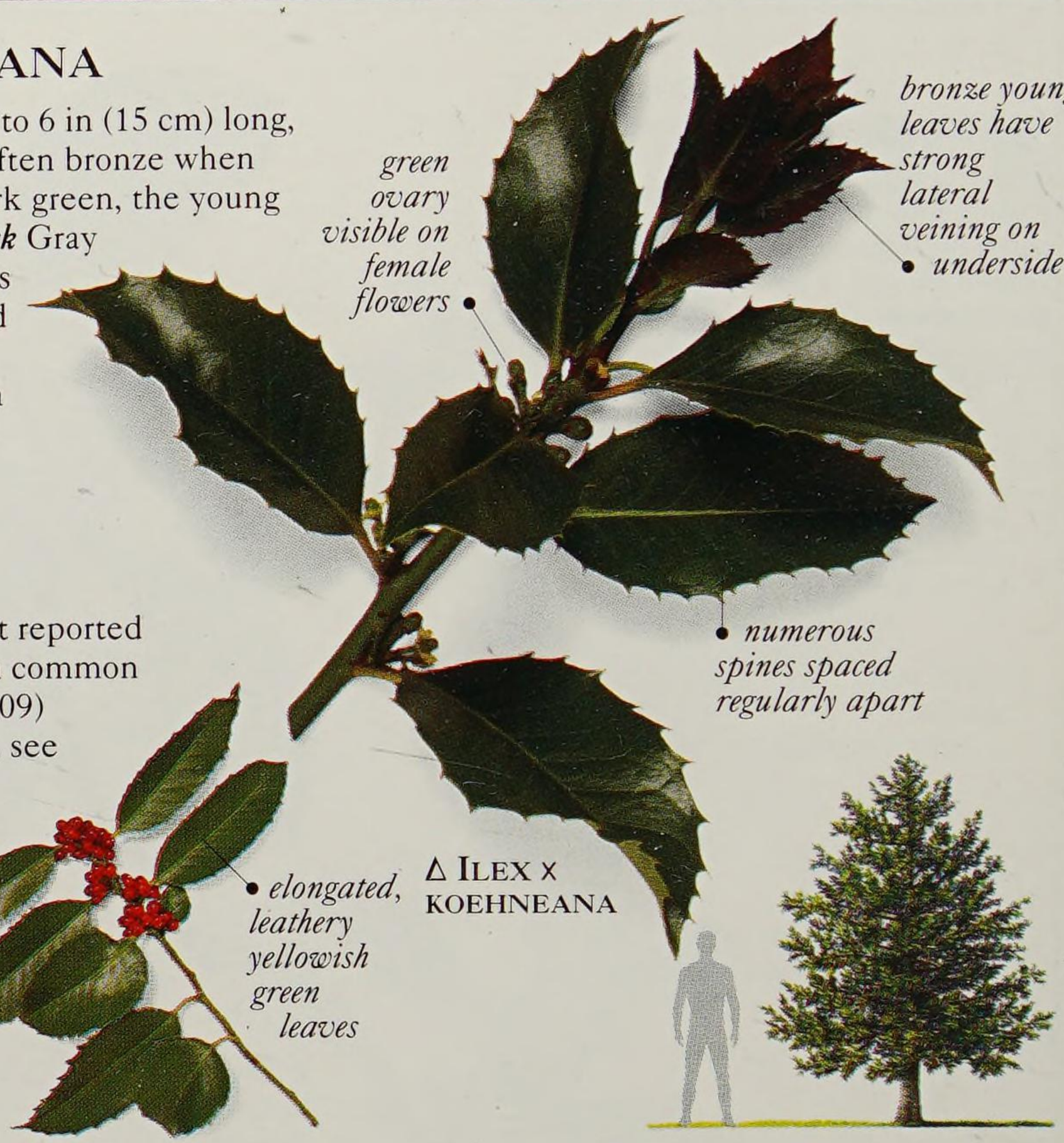
Family AQUIFOLIACEAE	Species *Ilex x koehneana*	Author Loesener

ILEX X KOEHNEANA

Leaves Elliptic to oblong, to 6 in (15 cm) long, very spiny at the margin, often bronze when young becoming glossy dark green, the young shoots flushed purple. ***Bark*** Gray and smooth. ***Flowers*** Males and females both small and greenish white, borne in clusters in the leaf axils, on separate plants in spring. ***Fruit*** A red berry, 5/16 in (8 mm) across.

• **NATIVE REGION**
Of garden origin.

• **REMARK** A hybrid, first reported in Florence, Italy, between common holly *(I. aquifolium*, see p.109) and tarajo holly *(I. latifolia*, see below). The large leaves show the influence of the latter parent.



'CHESTNUT LEAF' ▷
This form originated in France. It has strongly spined leaves and bears small, brilliant red berries.

Height 20 ft (6 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family AQUIFOLIACEAE	Species *Ilex latifolia*	Author Thunberg

TARAYO HOLLY

Leaves Oblong, to 8 in (20 cm) long and 3 in (7.5 cm) across, very thick, with coarse but not spiny teeth, glossy dark green above, yellow-green beneath, borne on stout shoots; young branches olive-green. ***Bark*** Gray, fissured with age. ***Flowers*** Males and females both small and yellow-green, in fragrant clusters in the leaf axils, on separate plants in late spring. ***Fruit*** A red-orange berry, 5/16 in (8 mm) across, in abundant clusters, ripe in late autumn.

• **NATIVE REGION**
E. China, Japan.

• **HABITAT** Warm regions.

• **REMARK** The very large leaves make the species unique among hollies of temperate origin. In Japan, it is often planted near temples.

Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

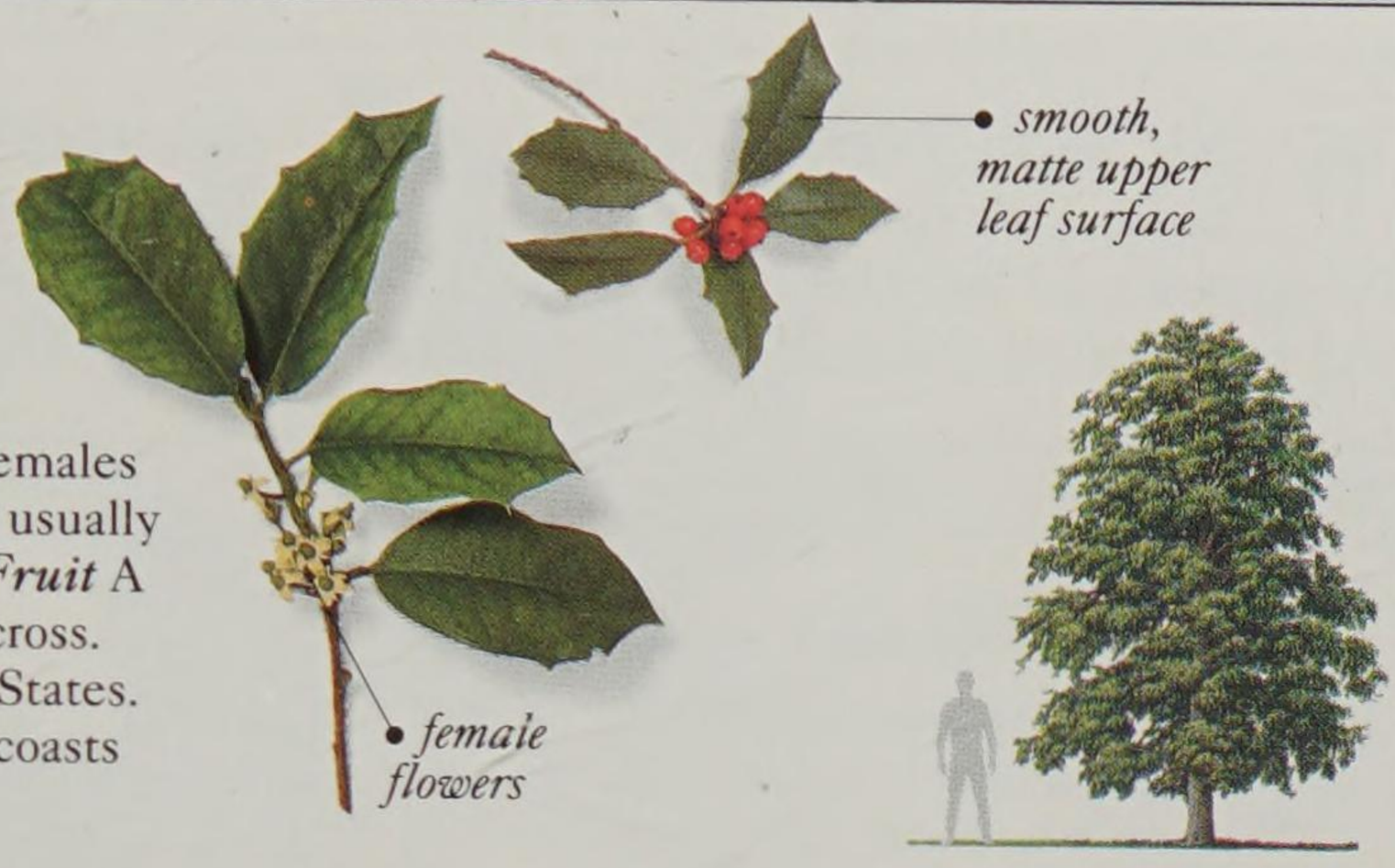
Family AQUIFOLIACEAE	Species *Ilex opaca*	Author Aiton

AMERICAN HOLLY

Leaves Elliptic, to 4 in (10 cm) long and 2 in (5 cm) across, spiny at the tip and margin, matte dark green or yellow-green above, yellow-green beneath. ***Bark*** Gray and smooth. ***Flowers*** Males and females small, dull white, in the leaf axils, usually on separate plants in late spring. ***Fruit*** A usually red berry, to ⅜ in (1 cm) across.

• **NATIVE REGION** E. United States.

• **HABITAT** Sandy soil near the coasts and moist woods.



Height 50 ft (15 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

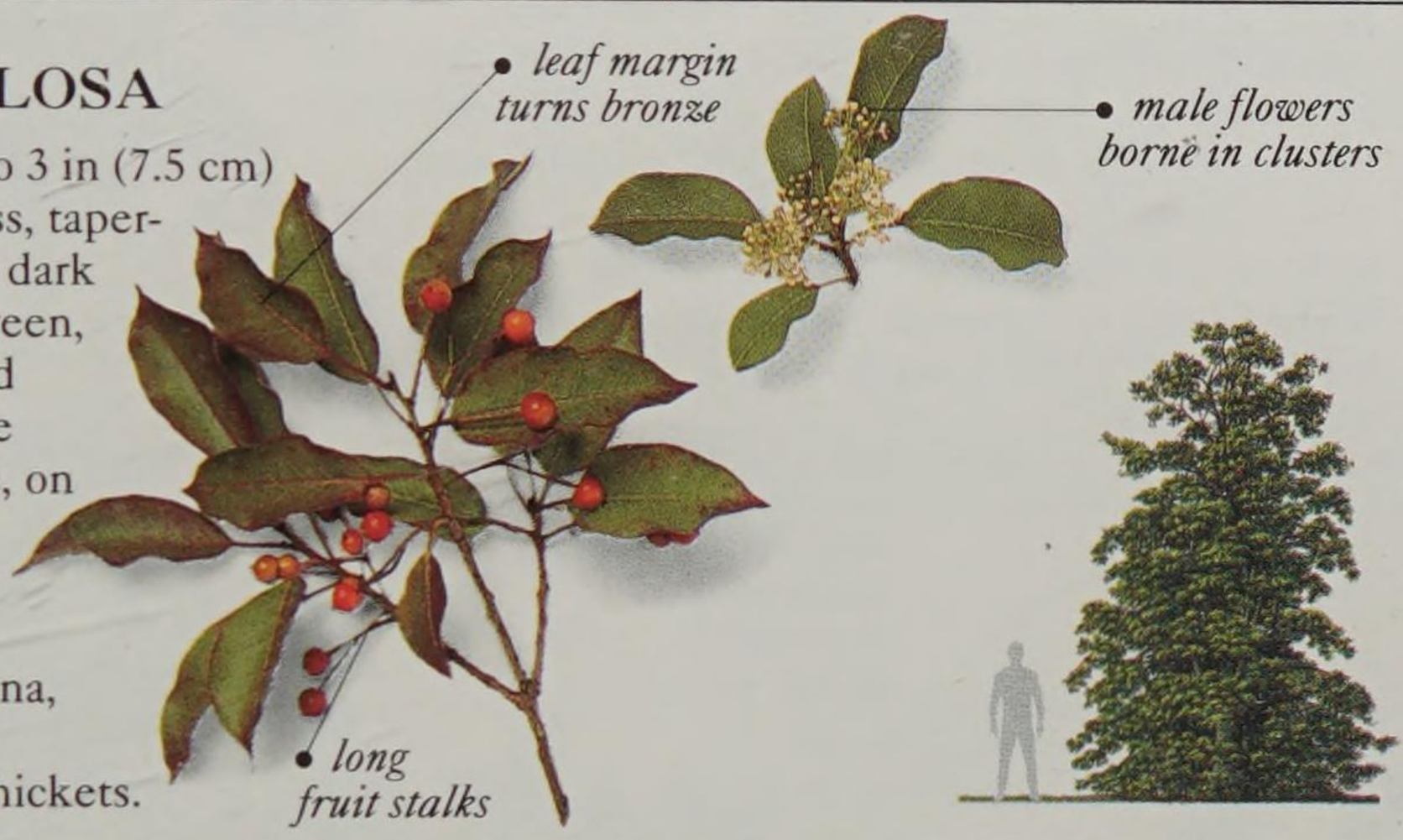
Family AQUIFOLIACEAE	Species *Ilex pedunculosa*	Author Miquel

ILEX PEDUNCULOSA

Leaves Ovate to elliptic, to 3 in (7.5 cm) long and 1¼ in (3 cm) across, taper-pointed, untoothed, glossy dark green above. ***Bark*** Gray-green, smooth. ***Flowers*** Males and females small, white, in the leaf axils and on the shoots, on separate plants in summer. ***Fruit*** A bright red berry, to 5/16 in (8 mm) across.

• **NATIVE REGION** China, Japan, Taiwan.

• **HABITAT** Woods and thickets.



Height 33 ft (10 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family AQUIFOLIACEAE	Species *Ilex purpurea*	Author Hasskarl

ILEX PURPUREA

Leaves Elliptic-lanceolate, to 4¾ in (12 cm) long and 1½ in (4 cm) across, tapered, toothed, glossy dark green above, paler beneath, smooth. ***Bark*** Gray, smooth. ***Flowers*** Males and females deep reddish lilac, the corona with four reflexed lobes, in the leaf axils and on the shoots, on separate plants in early to mid-summer. ***Fruit*** A red berry, 5/16 in (8 mm) long.

• **NATIVE REGION** China, Japan.

• **HABITAT** Mountain woods.

Height 42 ft (13 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

ARALIACEAE

WITH MORE THAN 50 GENERA and some 800 species, this family of evergreen and deciduous trees, shrubs, and herbaceous plants is found all over the world, particularly in the tropics. The leaves are usually compound or lobed, and the small, greenish white or white flowers are borne in clusters.

Family ARALIACEAE	Species *Aralia spinosa*	Author Linnaeus

DEVIL'S WALKING STICK

Leaves Bipinnate and very large, to 39 in (1 m) or more long, with numerous ovate, taper-pointed, toothed leaflets, to 3 in (7.5 cm) long and 1½ in (4 cm) across, bronze when young becoming dark green above, paler beneath, hairy on both sides, turning yellow to purple in autumn, with a prickly stalk, carried on very stout, spiny shoots. ***Bark*** Gray, with stout prickles. ***Flowers*** Small and white, in small, rounded clusters, the clusters forming large heads, borne on a single main axis in late summer. ***Fruit*** Rounded and purple-black, ¼ in (6 mm) long.

- **NATIVE REGION** E. United States.
- **HABITAT** Riverbanks and moist woods.
- **REMARK** Also known as angelica tree, Hercules' club.

ARALIA Δ∇ SPINOSA

∇ ARALIA ELATA
This similar species, from northeast Asia and Japan, flowers in autumn, when *Aralia spinosa* is in fruit.

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ARALIACEAE	Species *Kalopanax pictus*	Author (Thunberg) Nakai

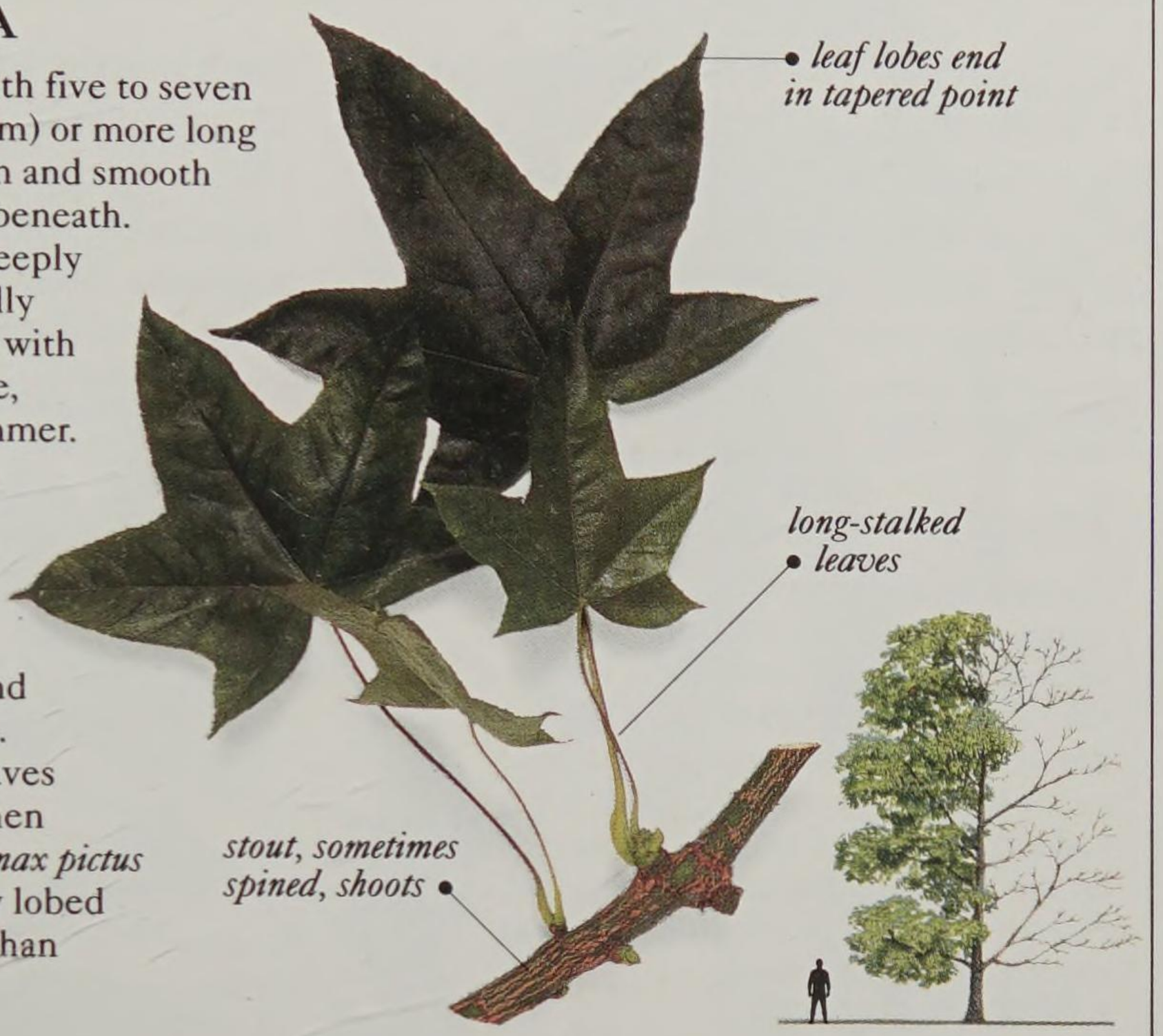
CASTOR ARALIA

Leaves Palmately lobed, with five to seven toothed lobes, to 10 in (25 cm) or more long and across, glossy dark green and smooth above, downy when young beneath. ***Bark*** Black-brown, spiny, deeply fissured. ***Flowers*** Individually small and white, numerous, with slender stalks, borne in large, rounded clusters in late summer. ***Fruit*** Rounded, blue-black, about 3/16 in (5 mm) long.

• **NATIVE REGION** China, Eastern Russian Federation, Japan, Korea.

• **HABITAT** Riverbanks and other moist places in forests.

• **REMARK** The young leaves of this species are edible when cooked. The similar *Kalopanax pictus* var. *maximowiczii* has deeply lobed leaves, which are cut more than halfway to the base.



Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ARALIACEAE	Species *Pseudopanax ferox*	Author (Kirk) Kirk

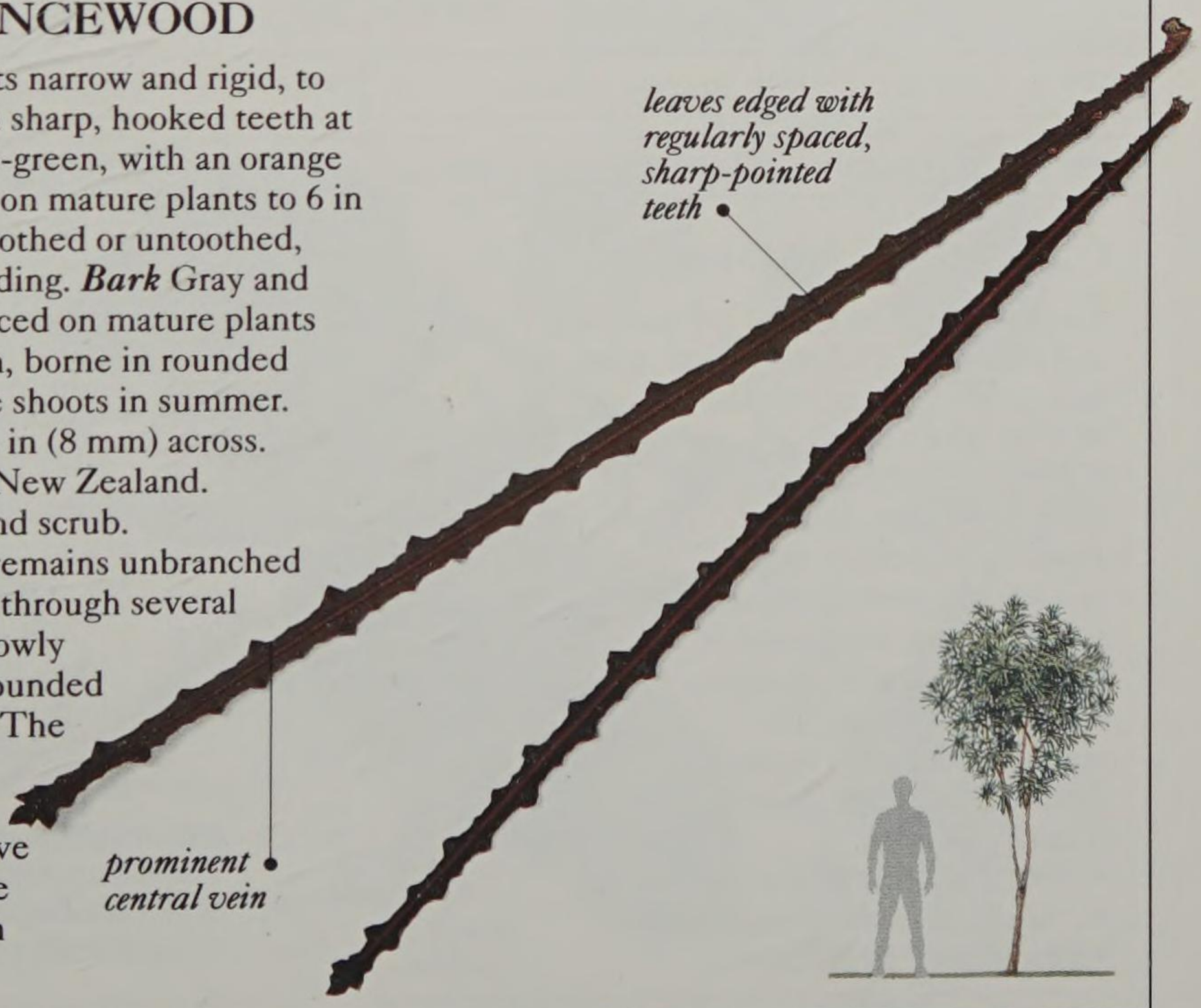
TOOTHED LANCEWOOD

Leaves On young plants narrow and rigid, to 18 in (45 cm) long, with sharp, hooked teeth at the margin, dark purple-green, with an orange midrib, pointing down; on mature plants to 6 in (15 cm) long, bluntly toothed or untoothed, carried upright to spreading. ***Bark*** Gray and smooth. ***Flowers*** Produced on mature plants only, small and greenish, borne in rounded heads at the ends of the shoots in summer. ***Fruit*** Oblong, black, 5/16 in (8 mm) across.

• **NATIVE REGION** New Zealand.

• **HABITAT** Forests and scrub.

• **REMARK** The tree remains unbranched for many years, passing through several stages of growth, and slowly developing the small, rounded head of a mature plant. The related *P. crassifolius* is commoner in the wild. This New Zealand native has even longer juvenile leaves, which may reach 39 in (1 m) or more.



Height 17 ft (5 m)	Shape Unique	Leaf persistence Evergreen	Leaf type

BETULACEAE

SOME OF THE best-known catkin-bearing plants belong to the birch family, which also includes the hazels *(Corylus*, see p.127). Its six genera and more than 150 species of deciduous trees and shrubs grow wild mainly in northern temperate regions; alders *(Alnus*, see pp.116–117) extend to the Andes. The leaves are alternate. Male and female flowers are borne in separate catkins on the same plant, but only the males are conspicuous.

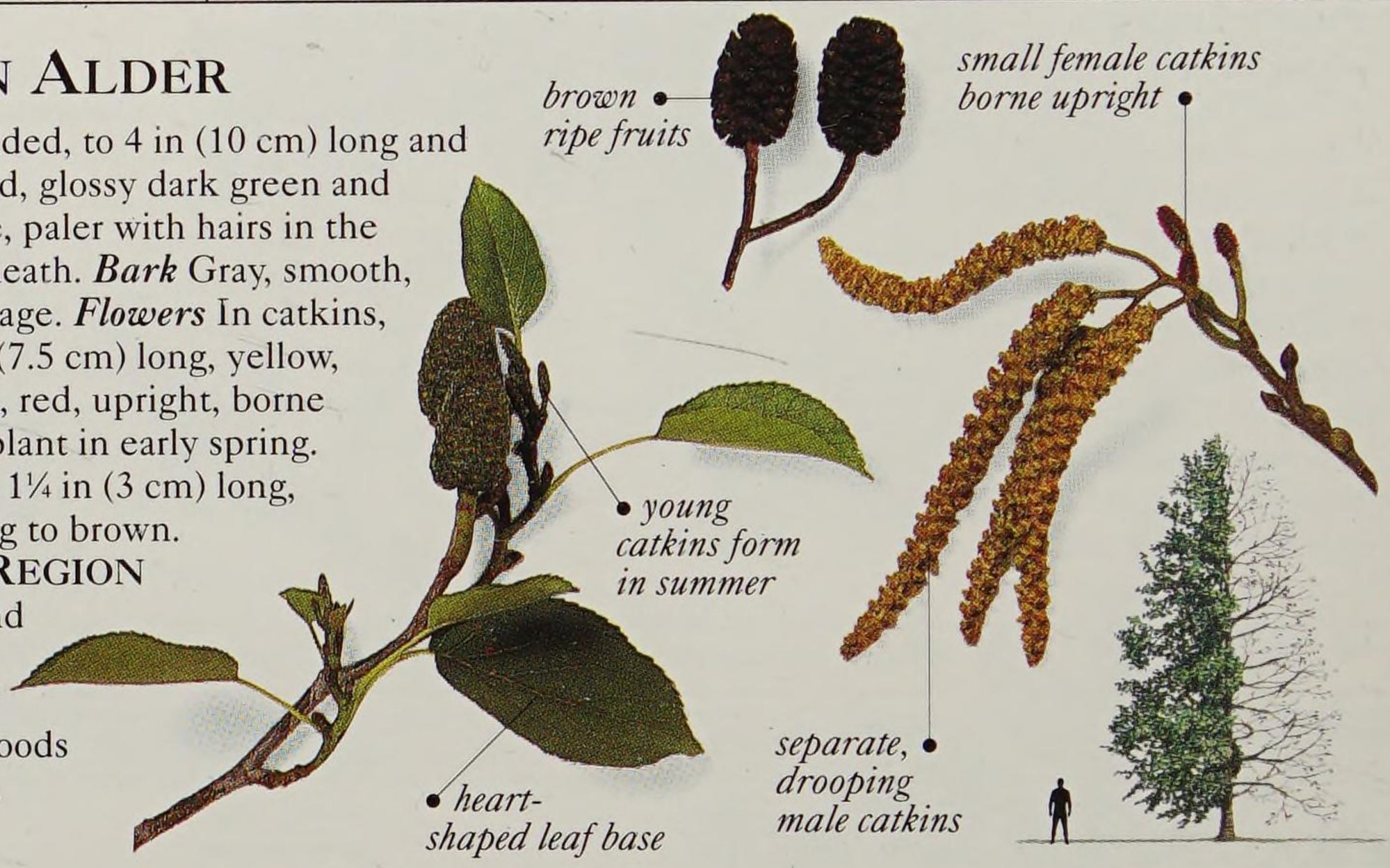
Family BETULACEAE	Species *Alnus cordata*	Author Desfontaines

ITALIAN ALDER

Leaves Rounded, to 4 in (10 cm) long and across, toothed, glossy dark green and smooth above, paler with hairs in the vein axils beneath. ***Bark*** Gray, smooth, fissured with age. ***Flowers*** In catkins, males to 3 in (7.5 cm) long, yellow, females small, red, upright, borne on the same plant in early spring. ***Fruit*** Woody, 1¼ in (3 cm) long, green ripening to brown.

• **NATIVE REGION**
Corsica, C. and S. Italy.

• **HABITAT**
Deciduous woods in mountains.



Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

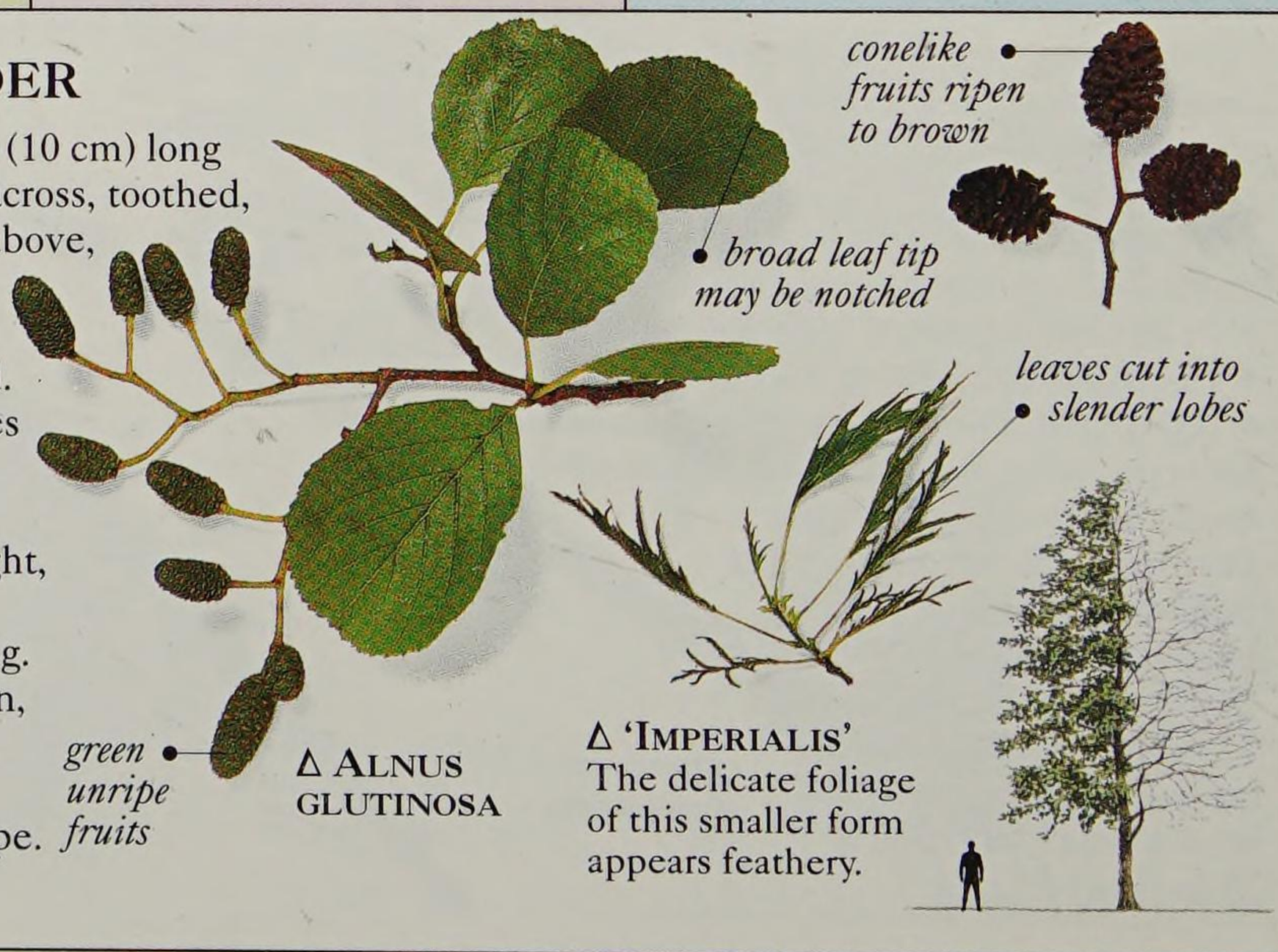
Family BETULACEAE	Species *Alnus glutinosa*	Author (Linnaeus) Gaertner

COMMON ALDER

Leaves Obovate, to 4 in (10 cm) long and about 3 in (7.5 cm) across, toothed, dark green and smooth above, with tufts of hairs in the vein axils beneath. ***Bark*** Dark gray, fissured. ***Flowers*** In catkins, males to 4 in (10 cm) long, yellow-green, drooping, females small, red, upright, borne separately on the same plant in early spring. ***Fruit*** Woody, dark brown, ¾ in (2 cm) long.

• **NATIVE REGION**
N. Africa, W. Asia, Europe.

• **HABITAT** By rivers.



Δ ALNUS GLUTINOSA

Δ 'IMPERIALIS'
The delicate foliage of this smaller form appears feathery.

Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Alnus incana*	Author (Linnaeus) Moench

WHITE ALDER

Leaves Ovate, to 4 in (10 cm) long and 2 in (5 cm) across, pointed at the tip, double-toothed and sometimes shallowly lobed, dull dark green above and hairy at first, gray and downy beneath. ***Bark*** Dark gray and smooth. ***Flowers*** In catkins, males to 4 in (10 cm) long, reddish, drooping, females small, red, upright, borne separately on the same plant in late winter to early spring. ***Fruit*** Woody, to ¾ in (2 cm) long, green ripening to brown.

• **NATIVE REGION**
Caucasus, Europe.

• **HABITAT**
Mountains.

Δ ALNUS INCANA

◁ 'AUREA'
This form has yellow foliage and orange shoots.

Δ ALNUS INCANA

Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Alnus oregona*	Author Nutt.

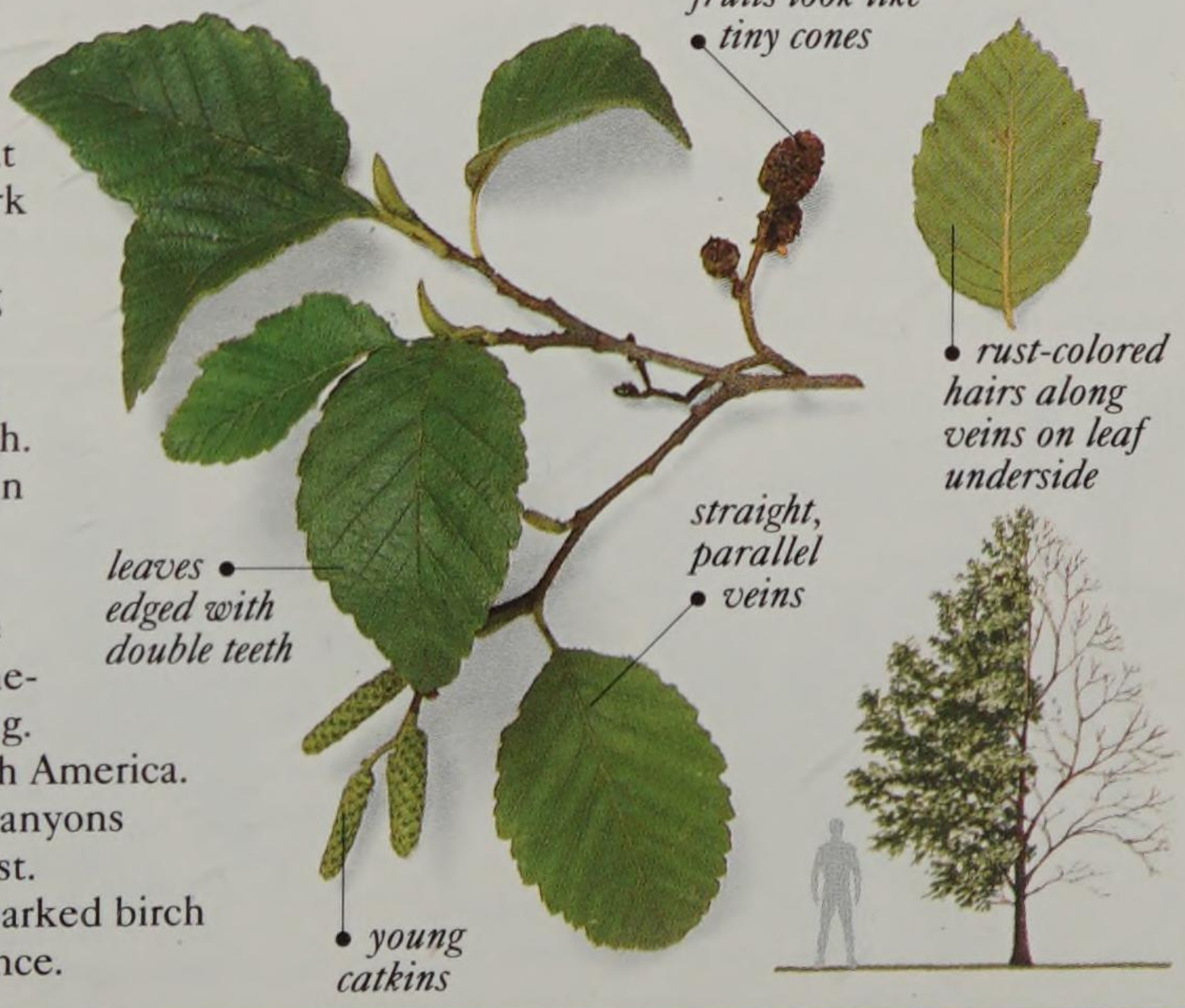
RED ALDER

Leaves Ovate to elliptic, to 4 in (10 cm) or more long and 3 in (7.5 cm) across, narrowed at the base, pointed at the tip, dark green and smooth or nearly so above, downy at first becoming blue-green and nearly smooth except for hairs along the veins beneath. ***Bark*** Light gray, rough. ***Flowers*** In catkins, males to 6 in (15 cm) long, yellow-orange, drooping, females small, red, upright, separately on the same plant in early spring. ***Fruit*** Cone-like, woody, to 1 in (2.5 cm) long.

• **NATIVE REGION** W. North America.

• **HABITAT** Riverbanks and canyons in mountains and along the coast.

• **REMARK** Resembles pale-barked birch species when seen from a distance.



Height 50 ft (15 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Betula albosinensis*	Author Burkill

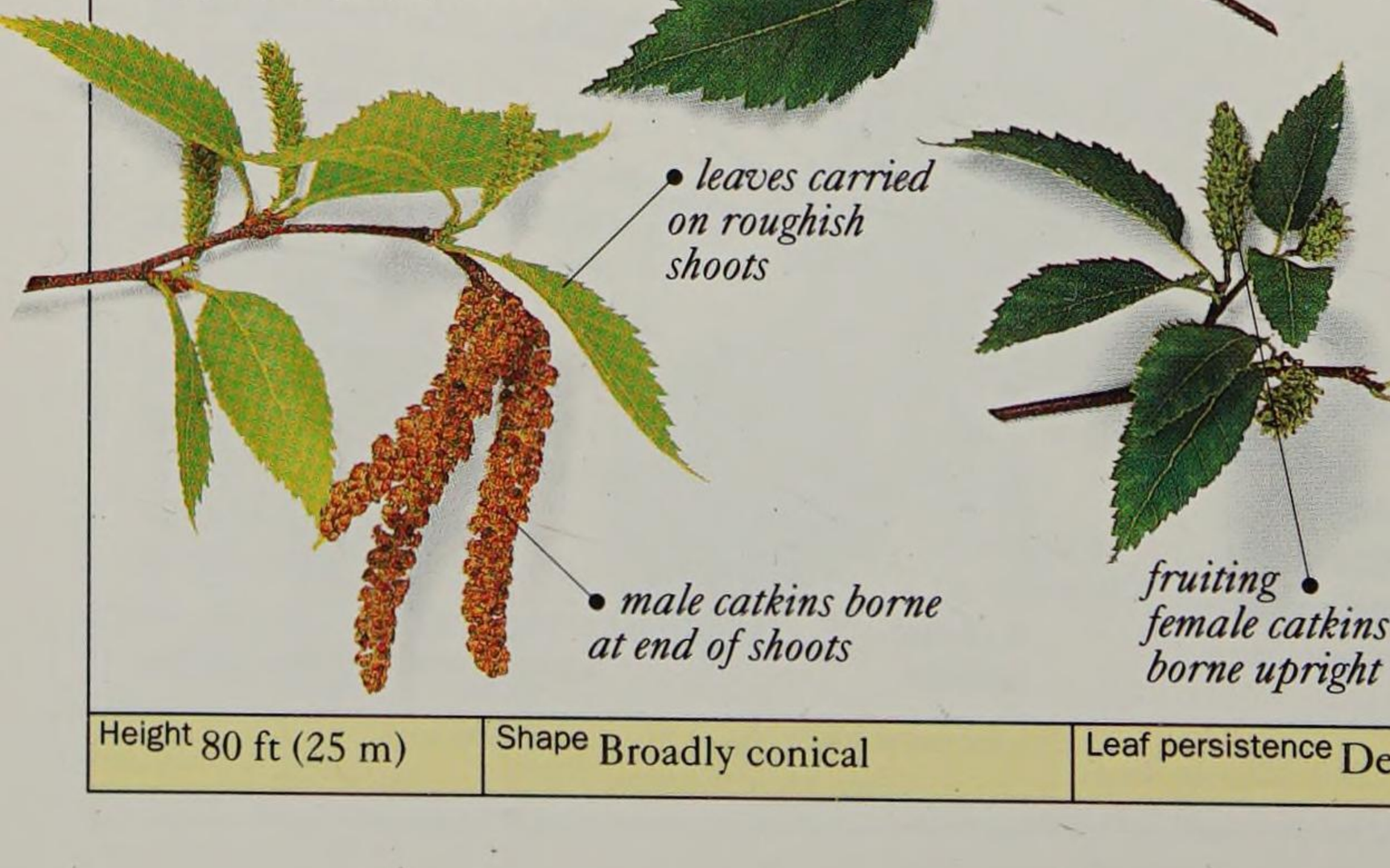
BETULA ALBOSINENSIS

Leaves Ovate, to 3 in (7.5 cm) long and 1½ in (4 cm) across, taper-pointed, toothed, downy when young becoming smooth and glossy green, turning yellow in autumn, carried on slightly rough shoots; young shoots sticky. ***Bark*** Orange-red to coppery red, peeling in thin, papery, horizontal strips; cream when freshly exposed. ***Flowers*** In catkins, males to 2½ in (6 cm), yellow, drooping, females green, upright, borne separately on the same plant in spring. ***Fruit*** A catkin, breaking up when ripe.

- **NATIVE REGION** W. China.
- **HABITAT** High woods in mountains.
- **REMARK** The colored, peeling bark makes this species one of the most striking of all the birches.

Δ **BETULA ALBOSINENSIS**

∇ **VAR. SEPTENTRIONALIS** This form is distinguished by its matte, rather than glossy, green leaves, and coppery to gray-pink bark.



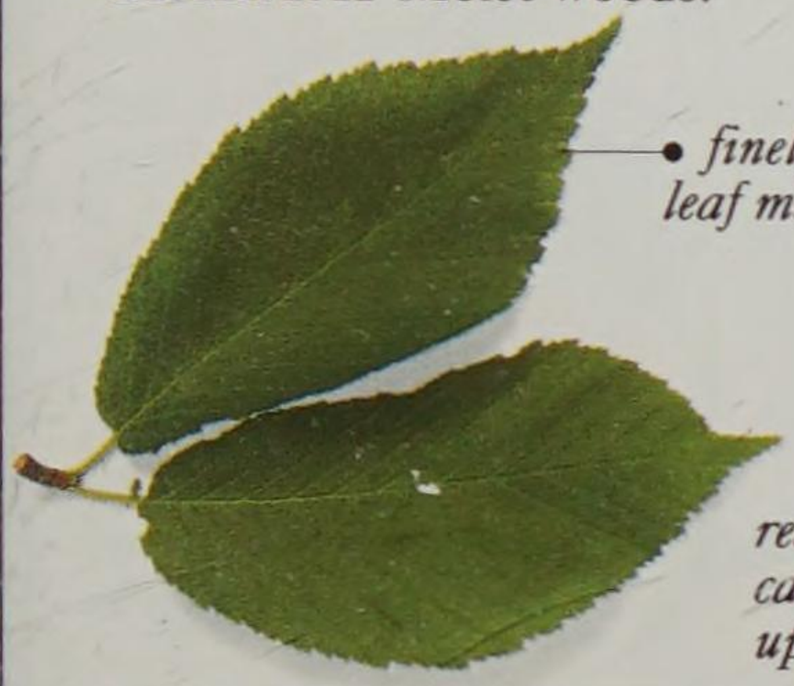
Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Betula alleghaniensis*	Author Britton

YELLOW BIRCH

Leaves Ovate-oblong, to 4 in (10 cm) or more long and 2 in (5 cm) across, pointed, toothed, becoming matte deep green above, paler beneath, turning yellow in autumn, on aromatic shoots. ***Bark*** Yellow-brown, peeling horizontally. ***Flowers*** In catkins, males to 4 in (10 cm) long, yellow, females reddish green, on the same plant in spring. ***Fruit*** A stout, erect catkin, breaking up when ripe.

- **NATIVE REGION** E. North America.
- **HABITAT** Moist woods.



Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Betula ermanii*	Author Chamisso

BETULA ERMANII

Leaves Ovate, to 3 in (7.5 cm) long and 2 in (5 cm) across, pointed, glossy green and smooth above, with hairy veins beneath, turning yellow in autumn. ***Bark*** Creamy white, with horizontal lenticels, peeling in strips. ***Flowers*** In catkins, males to 4 in (10 cm) long, yellowish, drooping, females green, upright, separately on the same plant in spring. ***Fruit*** A catkin, breaking up when ripe.

- **NATIVE REGION** N.E. Asia, Japan.
- **HABITAT** Forests to mountain level.

Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Betula grossa*	Author Siebold & Zuccarini

JAPANESE CHERRY BIRCH

Leaves Ovate, to 4 in (10 cm) long and 2 in (5 cm) across, taper-pointed, usually heart-shaped at the base, coarsely toothed, dark green above, silky-hairy on the veins beneath, turning yellow in autumn, carried on aromatic shoots. ***Bark*** Reddish, with horizontal bands, becoming dark gray with age. ***Flowers*** In catkins, males to 1 in (2.5 cm) long, yellow, drooping, females green, upright, separately on the same plant in spring. ***Fruit*** An erect catkin, breaking up when ripe.

- **NATIVE REGION** Japan.
- **HABITAT** Mountain forests.
- **REMARK** The species is closely related to the North American cherry birch *(Betula lenta*, see below), which has similar bark and aromatic shoots.

Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Betula lenta*	Author Linnaeus

CHERRY BIRCH

Leaves Ovate, to 4¾ in (12 cm) long and 2½ in (6 cm) across, taper-pointed, sharply toothed, glossy dark green above, paler and silky-hairy at least when young beneath, turning yellow in autumn, carried on aromatic shoots. ***Bark*** Red-brown, with pale, horizontal lenticels, becoming dark and furrowed. ***Flowers*** In catkins, males to 3 in (7.5 cm) long, yellow, drooping, females green, upright, separately on the same plant in spring. ***Fruit*** An erect catkin, breaking up when ripe.

- **NATIVE REGION** E. North America.
- **HABITAT** Moist woods at low altitude in the north to mountains in the south of its native region.
- **REMARK** Also known as black birch, sweet birch.

Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Betula maximowicziana*	Author Regel

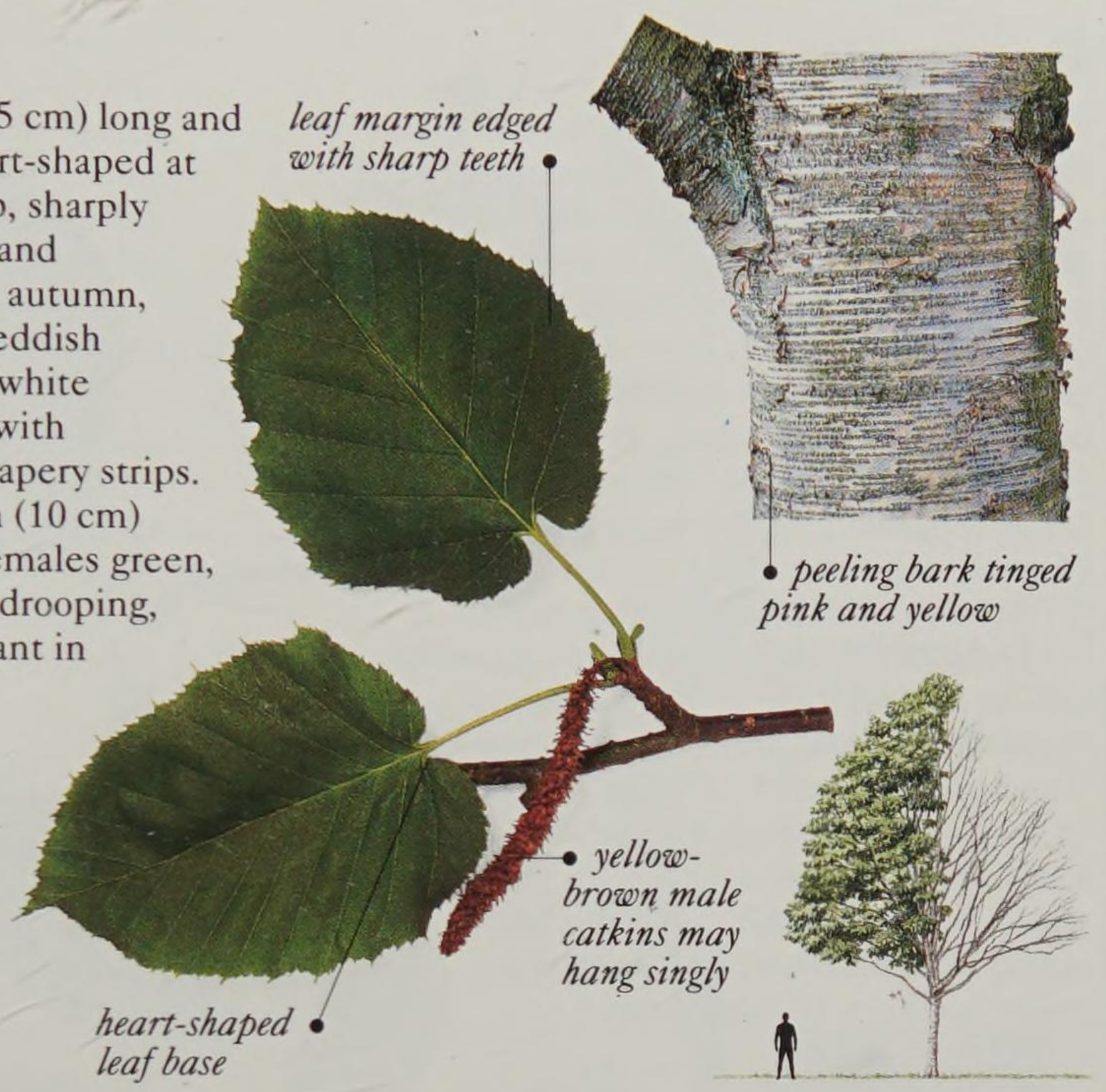
MONARCH BIRCH

Leaves Broadly ovate, to 6 in (15 cm) long and 4¾ in (12 cm) across, deeply heart-shaped at the base, taper-pointed at the tip, sharply and doubly toothed, dark green and smooth above, turning yellow in autumn, carried on warty shoots. ***Bark*** Reddish brown at first becoming grayish white tinged orange-yellow and pink, with horizontal lenticels, peeling in papery strips. ***Flowers*** In catkins, males to 4 in (10 cm) long, yellow-brown, drooping, females green, clustered together, spreading to drooping, borne separately on the same plant in late winter. ***Fruit*** A pendulous catkin, breaking up when ripe.

• **NATIVE REGION** C. and N. Japan.

• **HABITAT** Woods.

• **REMARK** Also known as Japanese red birch. The leaves are larger than those of any other birch.



Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

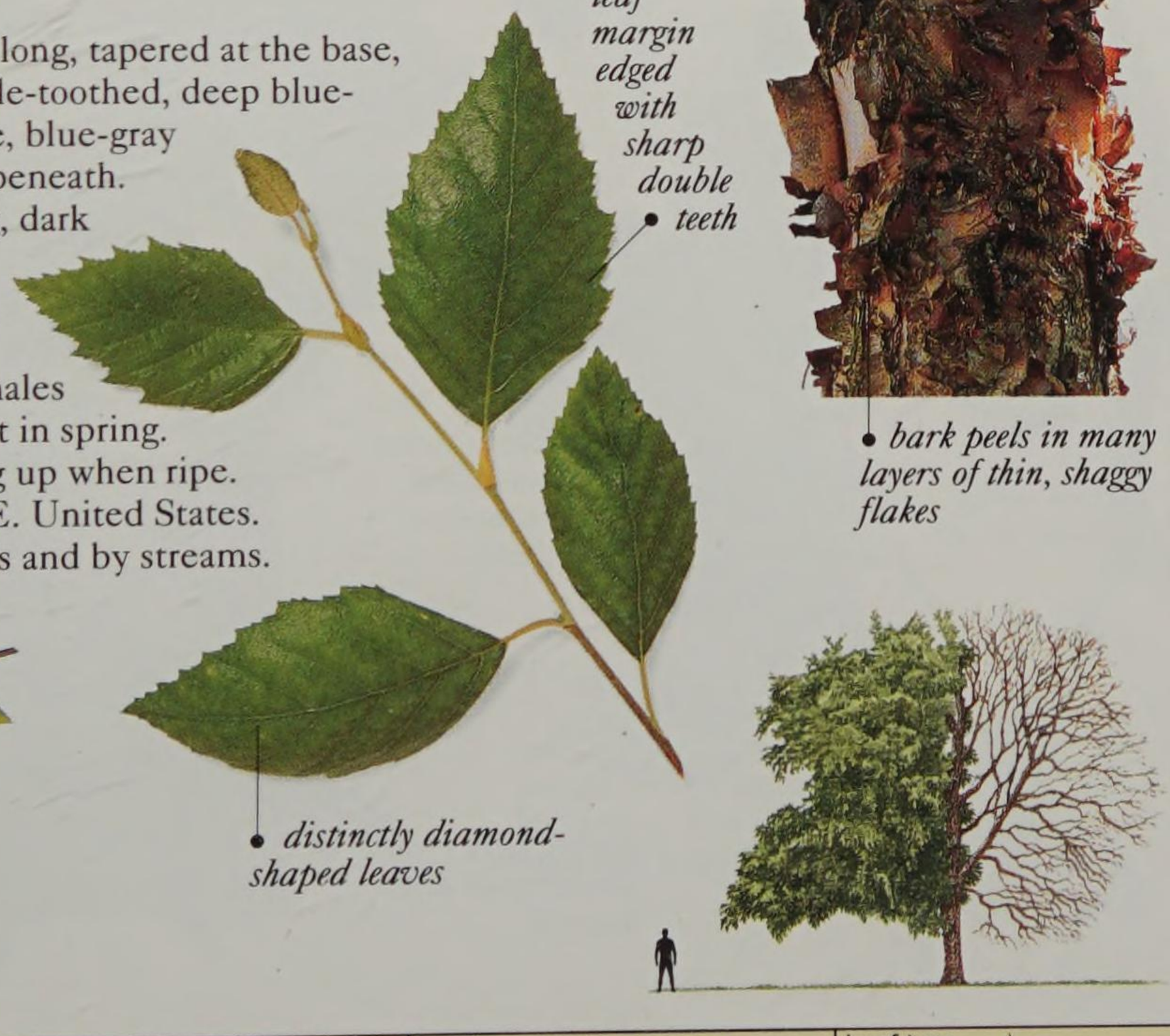
Family BETULACEAE	Species *Betula nigra*	Author Linnaeus

RIVER BIRCH

Leaves To 4 in (10 cm) long, tapered at the base, pointed at the tip, double-toothed, deep blue-green and smooth above, blue-gray with hairs on the veins beneath. ***Bark*** Pink-gray, peeling, dark brown and ridged with age. ***Flowers*** In catkins, males to 3 in (7.5 cm) long, yellow-brown, females green, on the same plant in spring. ***Fruit*** A catkin, breaking up when ripe.

• **NATIVE REGION** E. United States.

• **HABITAT** Wet woods and by streams.



Height 100 ft (30 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Betula papyrifera*	Author Marshall

PAPER BIRCH

Leaves Ovate, to 4 in (10 cm) long and 3 in (7.5 cm) across, taper-pointed, toothed, dark green above, paler and with hairs on the veins at least when young beneath, turning yellow to orange in autumn. ***Bark*** White, with conspicuous dark lenticels, peeling in thin layers; pale pinkish orange when freshly exposed. ***Flowers*** In catkins, males to 4 in (10 cm) long, yellow, drooping, females slender, green, spreading or drooping, borne separately on the same plant in spring. ***Fruit*** A catkin, breaking up when ripe.

• **NATIVE REGION** North America.

• **HABITAT** Woods in northerly latitudes and on mountains.

• **REMARK** Also known as canoe birch. The bark was used by Native Americans to make canoes, which gives the alternative common name. This most widespread of the American birches occurs from Labrador to Alaska and in the northern United States.

smooth leaf upperside

green fruiting catkins droop

leaf margin edged with small teeth

male catkins hang down from shoot tip

leaves turn from green to yellow and orange in autumn

bark spotted with dark, horizontal lenticels

paler leaf underside has hairy veins

female catkins hang at an angle

peeling bark reveals orange-pink layer beneath

Height 100 ft (30 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Betula pendula*	Author Roth

SILVER BIRCH

Leaves Ovate to triangular, to 2½ in (6 cm) long and 1½ in (4 cm) across, taper-pointed, coarsely double-toothed, glossy dark green above, turning yellow in autumn, carried on slender, hairless, warty, pendulous shoots. ***Bark*** White, developing dark, rugged cracks at the base with age. ***Flowers*** In catkins, males to 2½ in (6 cm) long, yellow, drooping, females green, upright or drooping, borne separately on the same plant in early spring. ***Fruit*** A catkin, breaking up when ripe.

- **NATIVE REGION** N. Asia, Europe.
- **HABITAT** Light, especially sandy, soil.
- **REMARK** Also known as European white birch. Forms extensive woods in its habitat.

Δ BETULA PENDULA

∇ BETULA PENDULA

BETULA ▷ PENDULA

'DALECARLICA' ▷
The small, slender leaves of the Swedish birch are cut into tapered, finely toothed lobes.

'PURPUREA' Δ
This ornamental form is selected for its deep purple foliage and red leaf stalks. The bark also develops a purple tinge.

Height 100 ft (30 m)	Shape Narrowly weeping	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Betula populifolia*	Author Marshall

GRAY BIRCH

Leaves Ovate to triangular, to 3 in (7.5 cm) long, ending in a long, tapered point, sharply toothed, glossy dark green and slightly rough above, turning yellow in autumn. ***Bark*** White, with black marks under the branches, not peeling, becoming black at the base with age. ***Flowers*** In catkins, males to 3 in (7.5 cm) long, yellow-brown, drooping, females green, upright, borne separately on the same plant in spring. ***Fruit*** A catkin, breaking up when ripe.

• **NATIVE REGION** E. North America.

• **HABITAT** Mountain woods.

• **REMARK** Also known as white birch. Grows in the wild from Nova Scotia in Canada to N. Carolina. The trees are often branched from the base, and are usually fast-growing, small, and short-lived.

Height 33 ft (10 m)	Shape Narrowly conical	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Betula pubescens*	Author Ehrhart

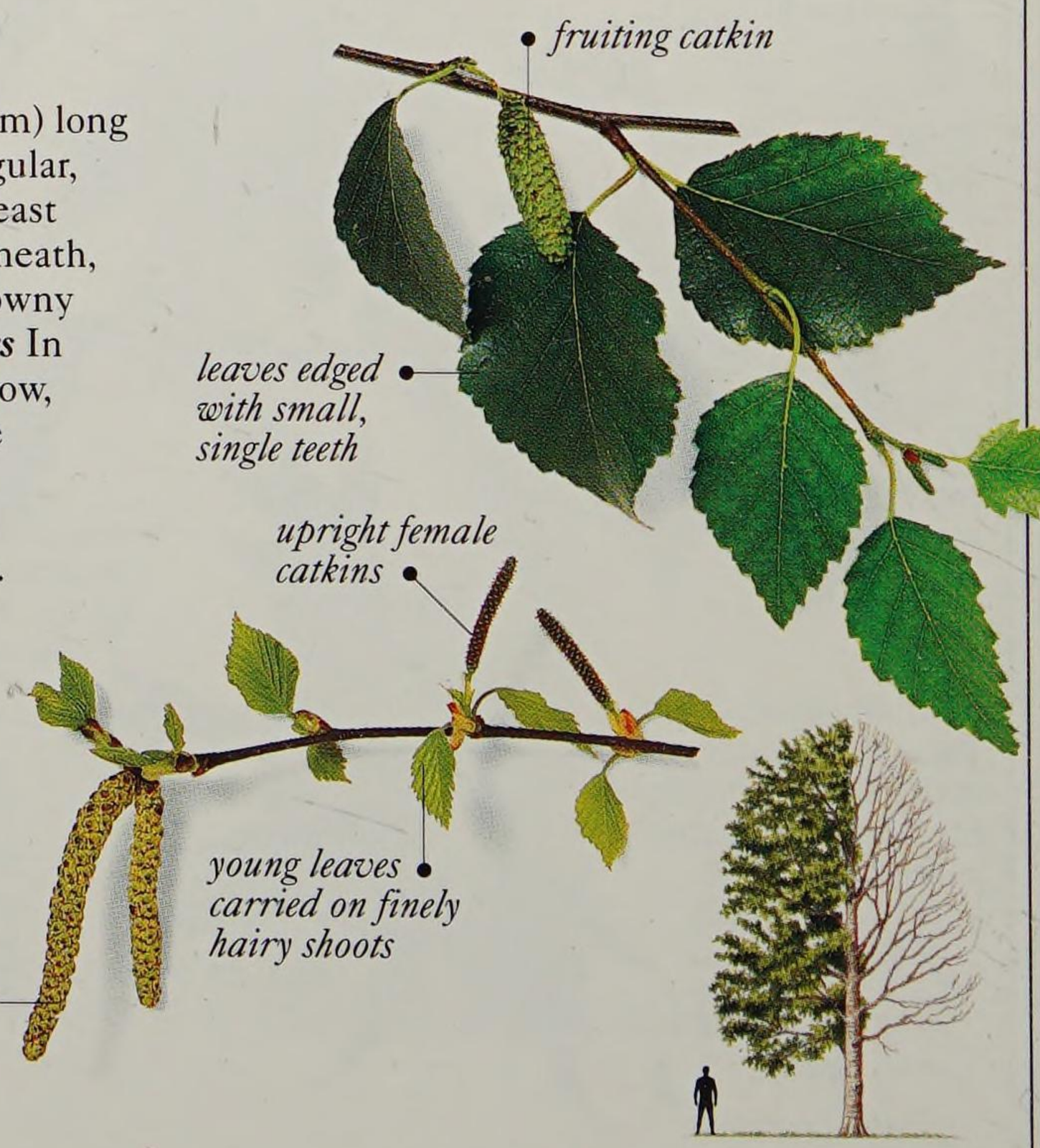
WHITE BIRCH

Leaves Rounded to ovate, to 2½ in (6 cm) long and 2 in (5 cm) across, pointed, with regular, single teeth, dark green and downy at least when young above and on the veins beneath, turning yellow in autumn, carried on downy shoots. ***Bark*** White to the base. ***Flowers*** In catkins, males to 2½ in (6 cm) long, yellow, drooping, females green, upright, borne separately on the same plant in spring. ***Fruit*** A catkin, breaking up when ripe.

• **NATIVE REGION** N. Asia, Europe.

• **HABITAT** Woods.

• **REMARK** Also known as downy birch. The species is related to the silver birch *(Betula pendula*, see p.123) but is easily distinguished by its shoots, which are hairy and not pendulous. In its habitat, it especially favors poor soil and wet ground.



Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Betula utilis*	Author D. Don

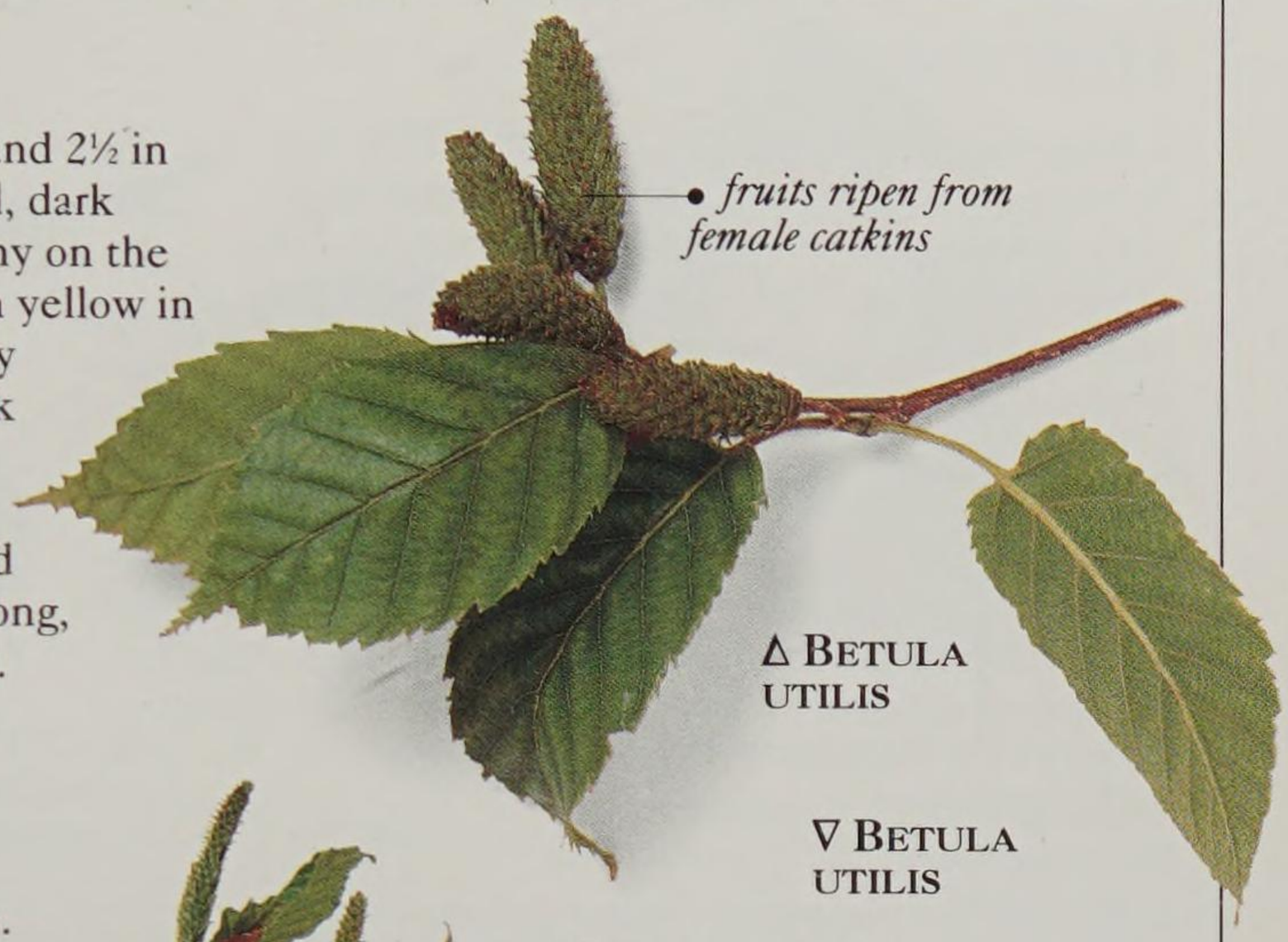
HIMALAYAN BIRCH

Leaves Ovate, to 4 in (10 cm) long and 2½ in (6 cm) across, taper-pointed, toothed, dark sometimes glossy green above, downy on the veins beneath, turning a rich, golden yellow in autumn, on downy shoots. ***Bark*** Very variable, glossy orange-brown or dark copper-brown to pinkish or pure white, paper-thin and peeling. ***Flowers*** In catkins, males yellow and drooping, to 4¾ in (12 cm) or more long, females green and upright, in spring. ***Fruit*** A catkin, green ripening to brown, breaking up when ripe.

• **NATIVE REGION** China, the Himalayas.

• **HABITAT** High mountain forests.

• **REMARK** This widely distributed species includes fine white-bark birches. The bark is used for roofing in the Himalayas.

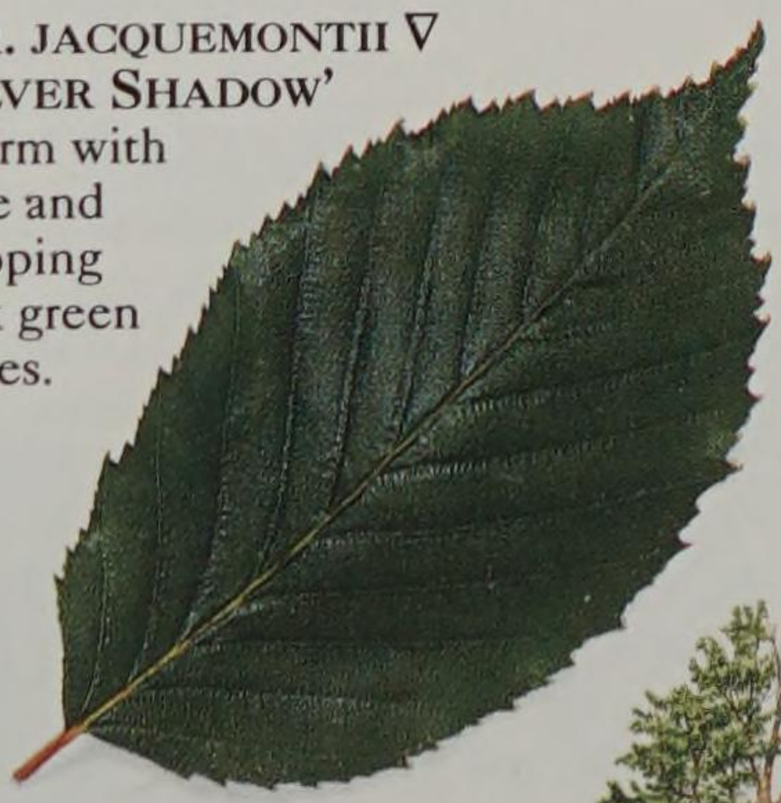


Δ BETULA UTILIS

∇ BETULA UTILIS

Δ VAR. JACQUEMONTII
This variety, characterized by its white bark, is variable in leaf. Three different forms are shown.

VAR. JACQUEMONTII ∇
'SILVER SHADOW'
A form with large and drooping dark green leaves.



VAR. JACQUEMONTII Δ
'GRAYSWOOD GHOST'
Very glossy leaves distinguish this attractive form.

◁ VAR. JACQUEMONTII
'JERMYNS'
This vigorous variety has broad leaves.

Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Carpinus betulus*	Author Linnaeus

HORNBEAM

Leaves Ovate-oblong, to 4 in (10 cm) long and 2½ in (6 cm) across, pointed, double-toothed, with conspicuous veins, dark green and smooth above, downy on the veins beneath, turning yellow in autumn. ***Bark*** Pale gray, fluted, fissured with age. ***Flowers*** In catkins, males to 2 in (5 cm) long, yellowish, drooping, females small, green, at the tips of the shoots, borne separately on the same plant in spring. ***Fruit*** A nut, with three-lobed bracts, the bracts green turning yellowish brown, clustered in pendulous catkins, to 3 in (7.5 cm) long.

- **NATIVE REGION** S.W. Asia, Europe.
- **HABITAT** Hedgerows and broadleaf woods.
- **REMARK** A common hedging plant.

Height 100 ft (30 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Carpinus caroliniana*	Author Walter

AMERICAN HORNBEAM

Leaves Ovate, to 4 in (10 cm) long, taper-pointed at the tip, double-toothed, dark green, turning orange to red in autumn, on slender shoots. ***Bark*** Gray, smooth, and fluted. ***Flowers*** In catkins, males to 1½ in (4 cm) long, yellowish, drooping, females small, green, at the tips of the shoots, borne separately on the same plant in spring. ***Fruit*** A nut, with two- or three-lobed, green bracts, clustered in pendulous catkins, to 3 in (7.5 cm) long.

- **NATIVE REGION** Mexico, E. North America.
- **HABITAT** Moist woods, riverbanks, and swamps.
- **REMARK** Also known as blue beech, water beech. Similar to beech *(Fagus*, see pp.151–153), but distinguished by its fruit.

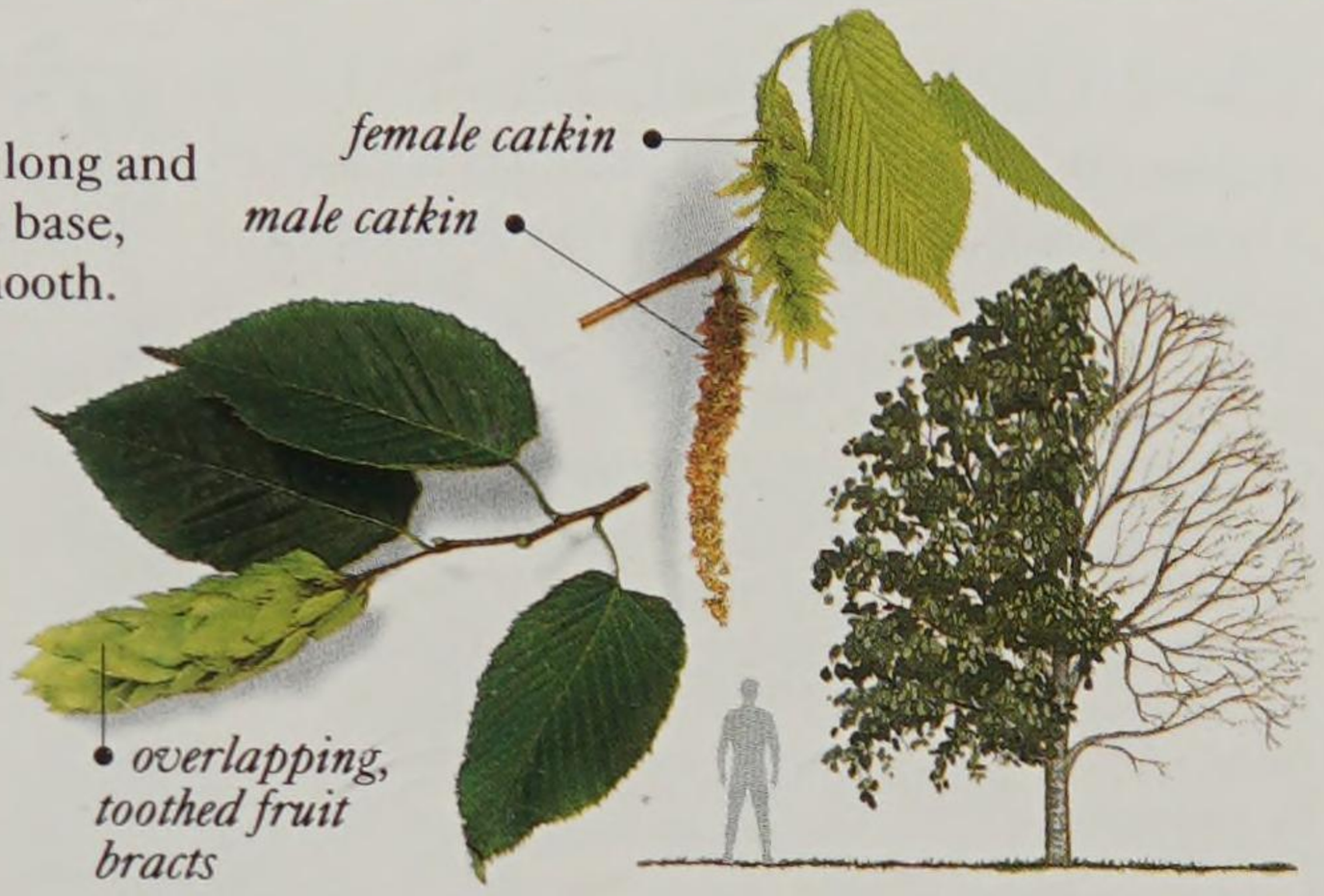
Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Carpinus cordata*	Author Blume

CARPINUS CORDATA

Leaves Oblong-ovate, to 4¾ in (12 cm) long and 3 in (7.5 cm) across, heart-shaped at the base, pointed, toothed, deep green above, smooth. ***Bark*** Gray-brown, smooth, furrowed with age. ***Flowers*** In catkins, males to 2 in (5 cm) long, yellowish, females small, green, at the tips of the shoots, separately on the same plant in spring. ***Fruit*** A nut, with green bracts, in hanging catkins, to 4 in (10 cm) long.

- **NATIVE REGION** Japan.
- **HABITAT** Mountain woods.



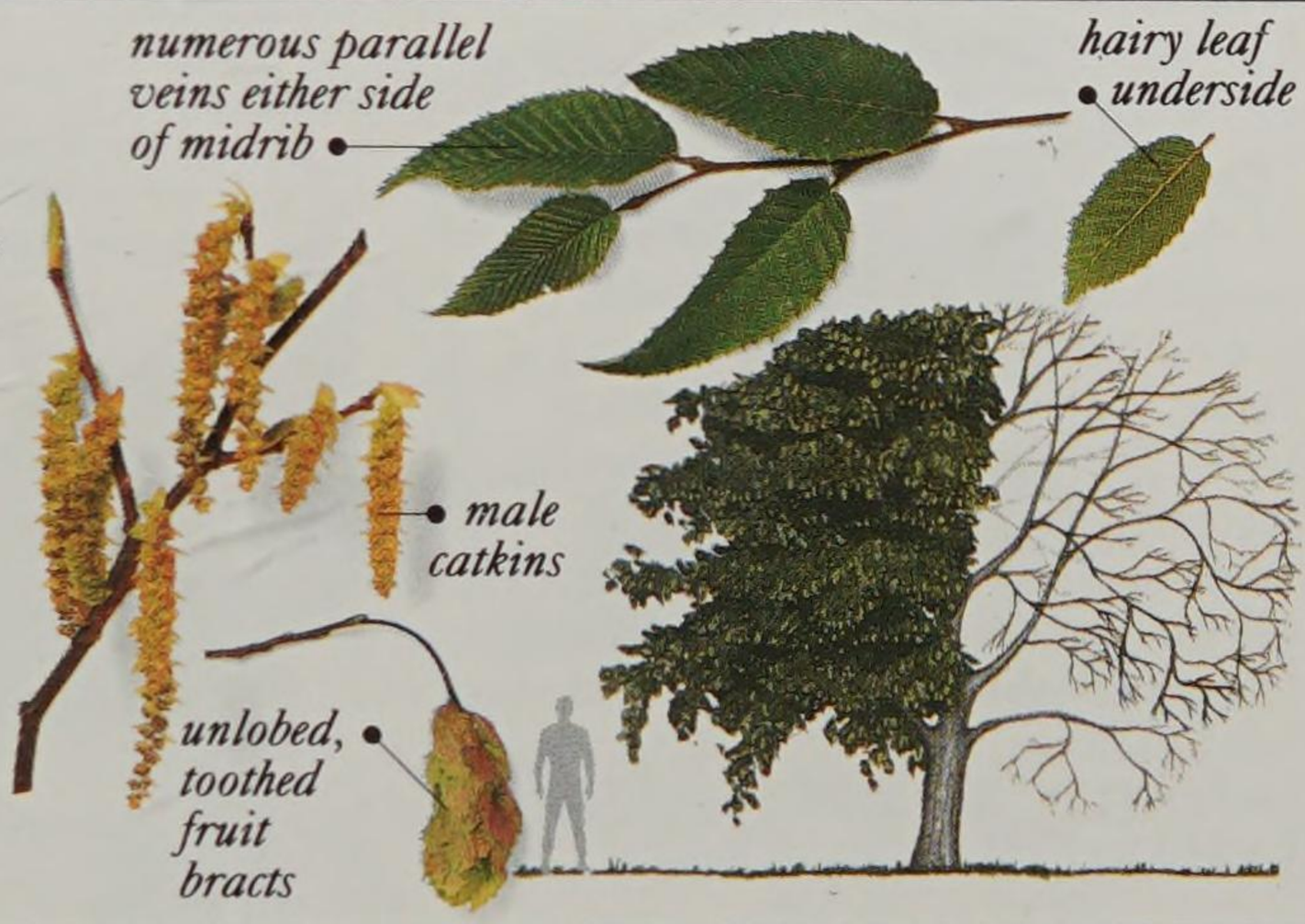
Height 50 ft (15 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Carpinus japonica*	Author Blume

CARPINUS JAPONICA

Leaves Ovate-oblong, to 4 in (10 cm) long and 1½ in (4 cm) across, pointed, toothed, dark green and smooth above, turning yellow in autumn. ***Bark*** Gray, smooth, dark brown and scaly with age. ***Flowers*** In catkins, males to 2 in (5 cm) long, yellowish, females small, green, at tips of the shoots, on the same plant in spring. ***Fruit*** A nut, with toothed bracts, in catkins, to 2½ in (6 cm) long.

- **NATIVE REGION** Japan.
- **HABITAT** Woods and thickets.



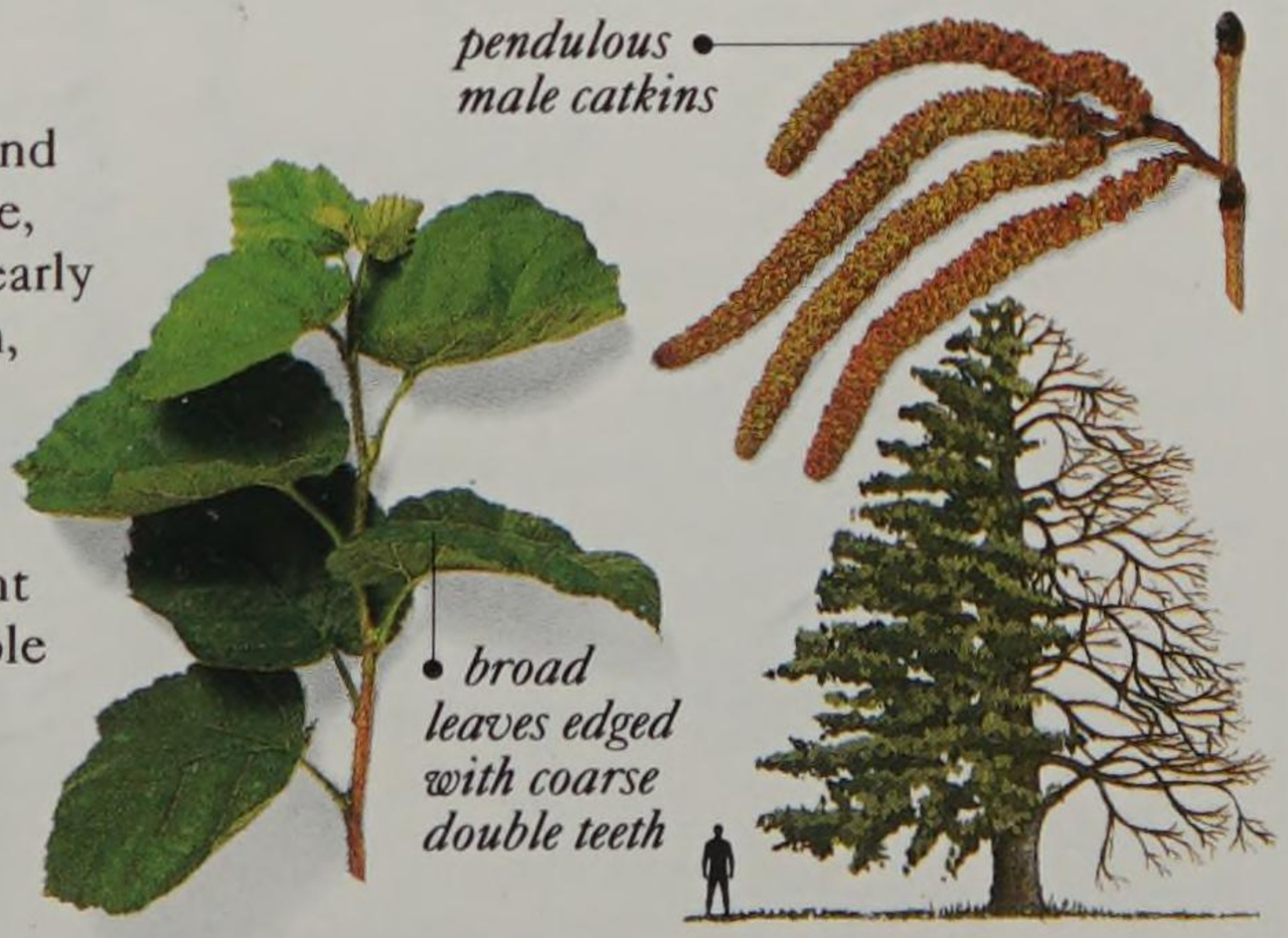
Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Corylus colurna*	Author Linnaeus

TURKISH HAZEL

Leaves Broadly oval, to 6 in (15 cm) long and 4 in (10 cm) across, heart-shaped at the base, coarsely double-toothed, dark green and nearly smooth above, downy on the veins beneath, turning yellow in autumn. ***Bark*** Gray and corky. ***Flowers*** In catkins, males to 3 in (7.5 cm) long, yellow, drooping, females very small, red, separately on the same plant in late winter to early spring. ***Fruit*** An edible nut, enclosed in a deeply lobed husk.

- **NATIVE REGION** S.W. Asia, S.E. Europe.
- **HABITAT** Shady mountain forests.



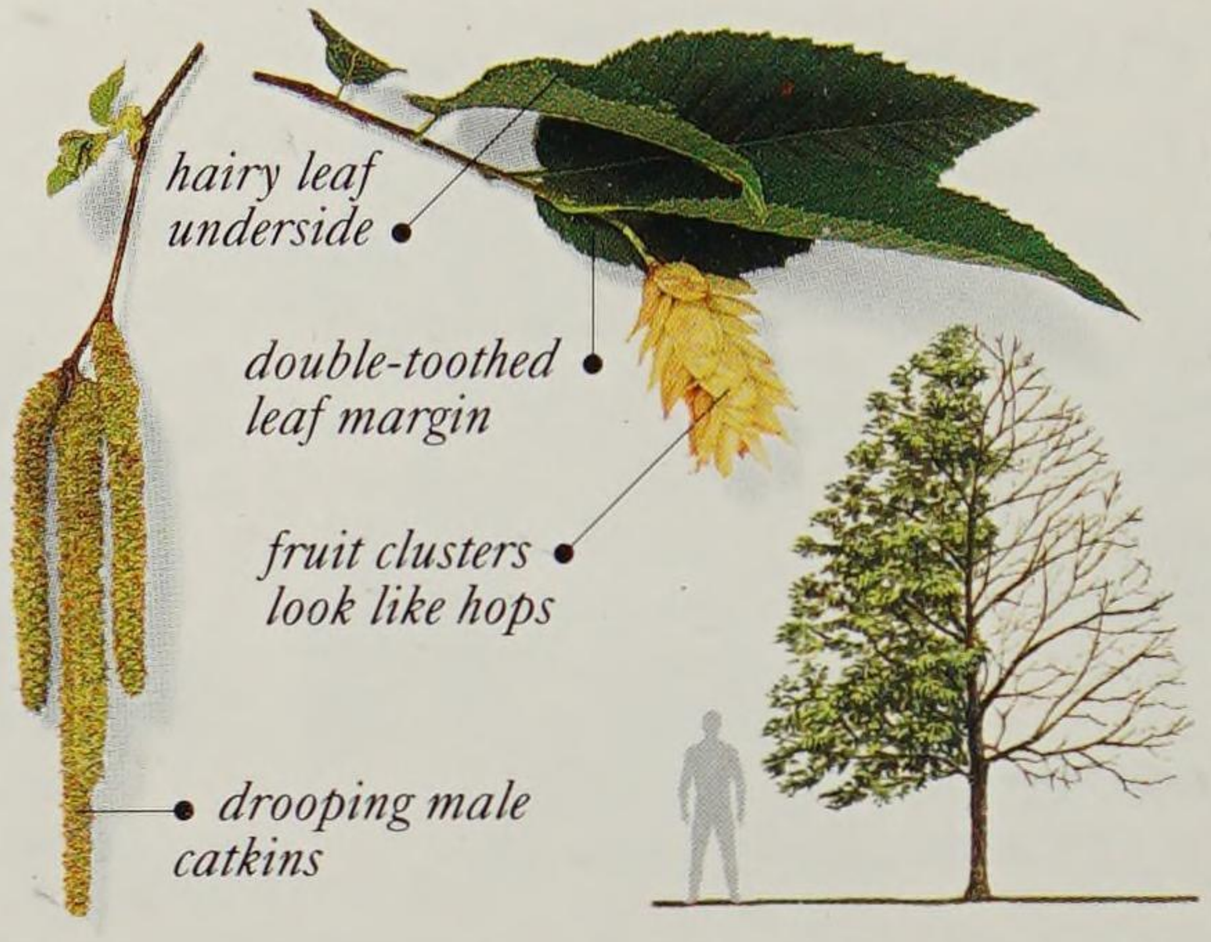
Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Ostrya carpinifolia*	Author Scopoli

HOP HORNBEAM

Leaves Ovate, to 4 in (10 cm) long and 2 in (5 cm) across, pointed, double-toothed, dark green above, sparsely hairy on both sides. ***Bark*** Gray and smooth, becoming brown and flaking with age. ***Flowers*** In catkins, males to 3 in (7.5 cm) long, yellow, drooping, females small, green, borne separately on the same plant in spring. ***Fruit*** A nut, enclosed in a bladderlike creamy husk, in pendulous clusters, to 2 in (5 cm) long.

- **NATIVE REGION** W. Asia, S. Europe.
- **HABITAT** Low forests in mountains.



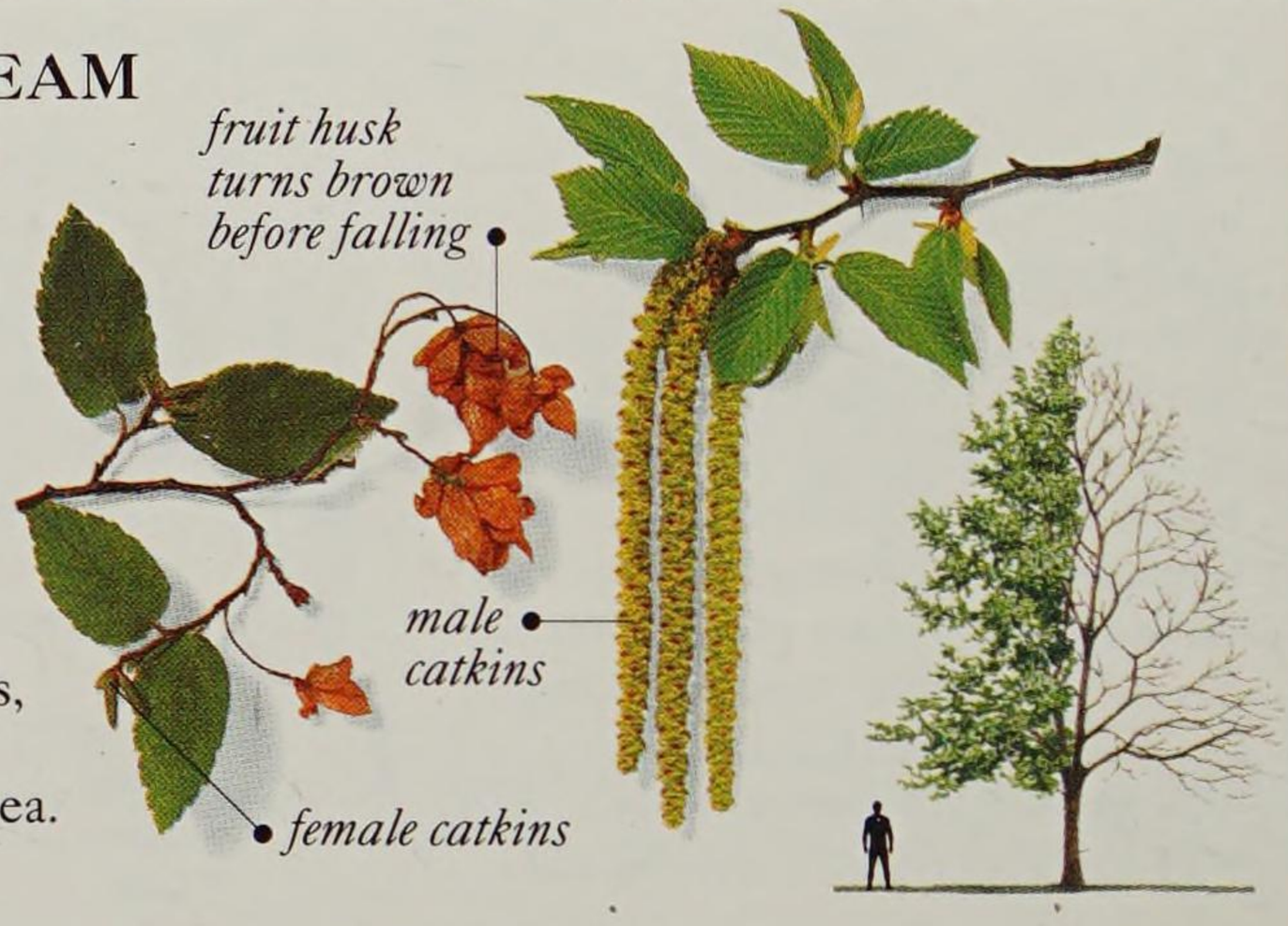
Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Ostrya japonica*	Author Sargent

JAPANESE HOP HORNBEAM

Leaves Ovate, to 4¾ in (12 cm) long and 2 in (5 cm) across, taper-pointed, sharply toothed, dark green above, softly hairy on both sides. ***Bark*** Gray-brown and scaly. ***Flowers*** In catkins, males to 3 in (7.5 cm) long, yellow, drooping, females very small, green, borne separately on the same plant in spring. ***Fruit*** A nut, enclosed in a bladderlike creamy husk, borne in pendulous clusters, to 2 in (5 cm) long.

- **NATIVE REGION** China, Japan, Korea.
- **HABITAT** Mountain woods.



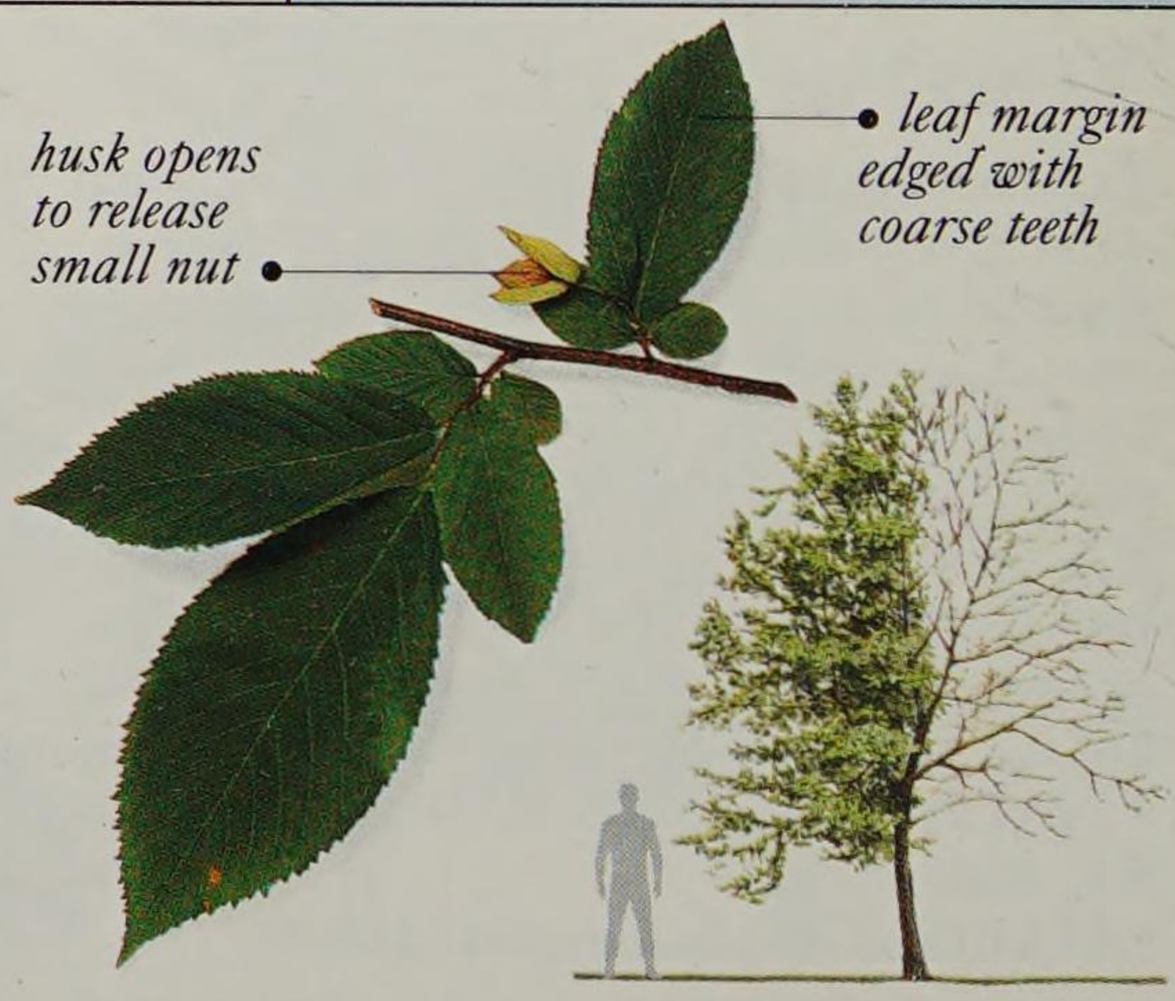
Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family BETULACEAE	Species *Ostrya virginiana*	Author (Miller) K. Koch

IRONWOOD

Leaves Ovate, to 4¾ in (12 cm) long and 2 in (5 cm) across, pointed, toothed, dark green and smooth above, with tufts of hairs in the vein axils beneath. ***Bark*** Gray-brown and scaly. ***Flowers*** In catkins, males to 2 in (5 cm) long, yellow, drooping, females small, green, borne separately on the same plant in spring. ***Fruit*** A nut, enclosed in a bladderlike creamy husk, borne in hanging clusters, to 2½ in (6 cm) long.

- **NATIVE REGION** E. North America.
- **HABITAT** Woods.
- **REMARK** Also known as American hop hornbeam.



Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

BIGNONIACEAE

THIS IS A LARGELY TROPICAL family, with evergreen and deciduous trees, shrubs, a few herbaceous plants, and many climbers. It comprises more than 100 genera and some 700 species, widely distributed, found particularly in South America. The leaves are often compound and are arranged in whorls or opposite. The tubular flowers end in an often frilly-petaled, flared bell.

Family BIGNONIACEAE	Species *Catalpa bignonioides*	Author Walter

SOUTHERN CATALPA

Leaves Broadly ovate, to 10 in (25 cm) long and 8 in (20 cm) across, heart-shaped at the base, short-pointed at the tip, occasionally lobed, untoothed, tinged purple and downy when young becoming light green and smooth above, paler and downy beneath, carried on long stalks. ***Bark*** Gray-brown and scaly. ***Flowers*** Bell-shaped, 2 in (5 cm) long, two-lipped, white, with yellow and purple spots, borne in large panicles in mid- to late summer. ***Fruit*** A slender, beanlike, hanging pod, to 16 in (40 cm) long, with inedible seeds, long-persistent.

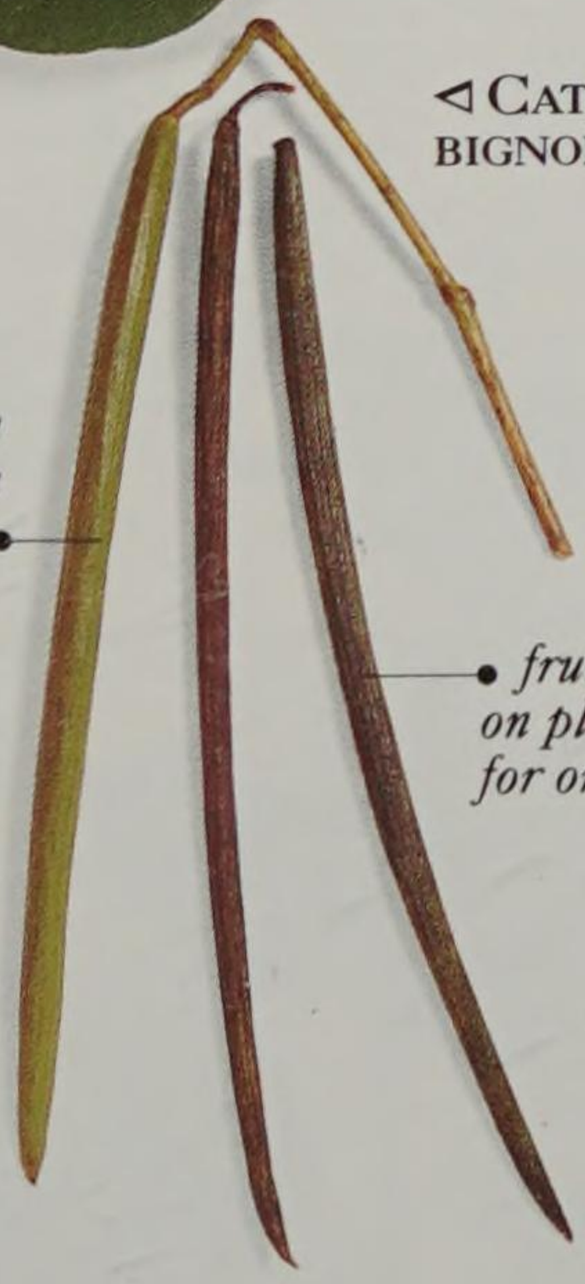
• **NATIVE REGION**
S.E. United States.

• **HABITAT** Streambanks and low woods.

• **REMARK** Also known as Indian bean tree.

◁ CATALPA BIGNONIOIDES

∇ CATALPA BIGNONIOIDES



◁ CATALPA BIGNONIOIDES

∆ 'AUREA'
The bright yellow young leaves of this form change to green after midsummer.

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family BIGNONIACEAE	Species *Catalpa* x *erubescens*	Author Carrière

CATALPA X ERUBESCENS

Leaves Three-lobed, to 12 in (30 cm) long and 10 in (25 cm) or more across, untoothed, bronze becoming light green. ***Bark*** Gray-brown, with scaly ridges. ***Flowers*** Bell-shaped, 1½ in (4 cm) long, white, with yellow and purple spots, fragrant, in large panicles in late summer. ***Fruit*** A beanlike hanging pod, to 16 in (40 cm) long.

• **NATIVE REGION**
Of garden origin.

• **REMARK** A hybrid between Indian bean tree *(Catalpa bignonioides*, see p.129) and the Chinese *Catalpa ovata*. 'Purpurea,' shown here, has black-purple young foliage.

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family BIGNONIACEAE	Species *Catalpa fargesii*	Author Bureau

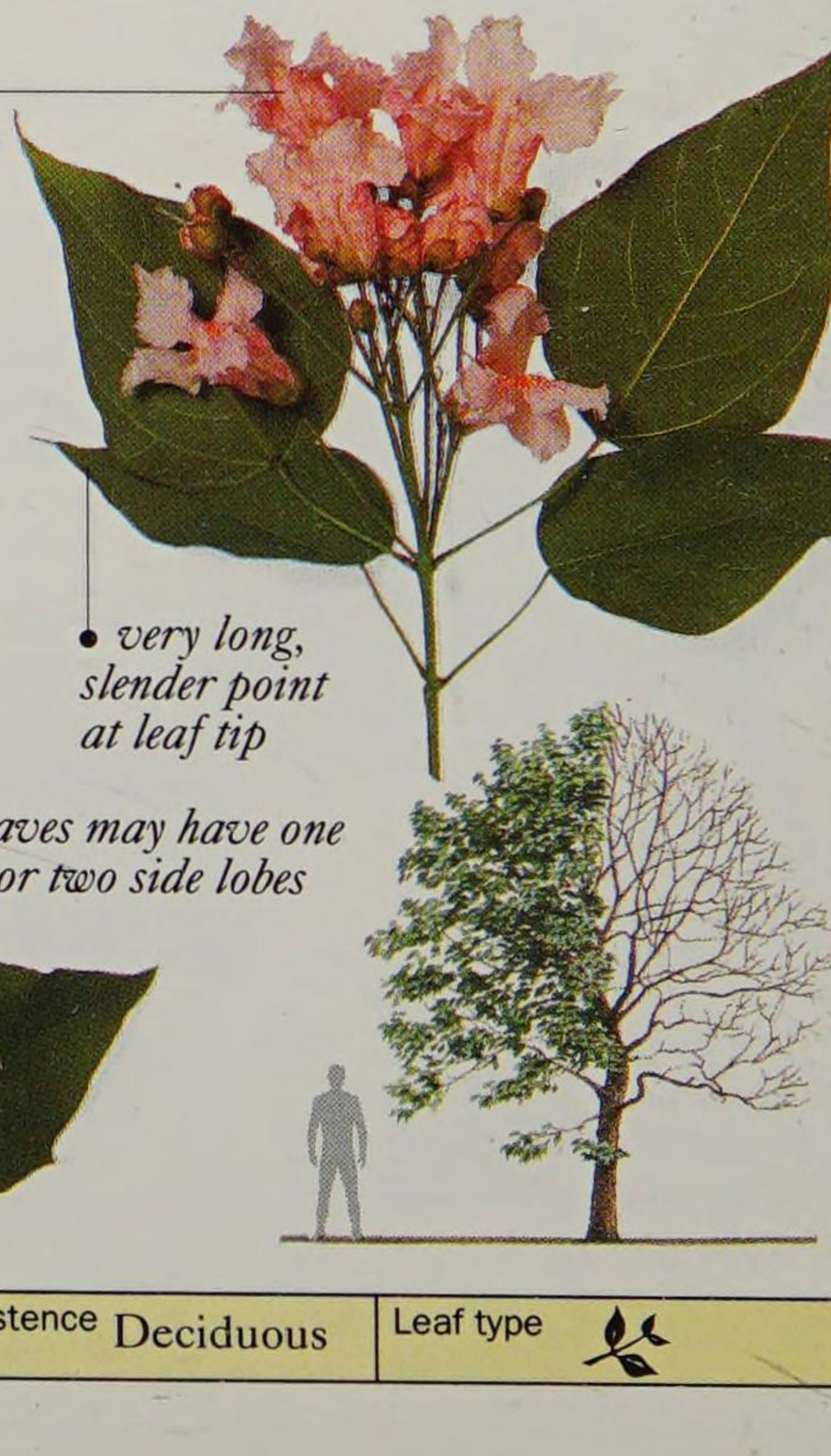
CATALPA FARGESII

Leaves Broadly ovate, to 6 in (15 cm) long and 4¾ in (12 cm) across, sometimes with one or two taper-pointed side lobes, bronze when young becoming very glossy green, usually downy beneath. ***Bark*** Dark gray, peeling in rectangular plates; pale gray-pink when freshly exposed. ***Flowers*** Bell-shaped, 2 in (5 cm) long, pink, with purple spots and a yellow blotch, in clusters in midsummer. ***Fruit*** A beanlike hanging pod, to 18 in (45 cm) long.

• **NATIVE REGION** W. China.

• **HABITAT** Open areas in mountains.

• **REMARK** Usually flowers somewhat earlier than other species of its genus. The most common form in cultivation is var. *duclouxii*.



Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

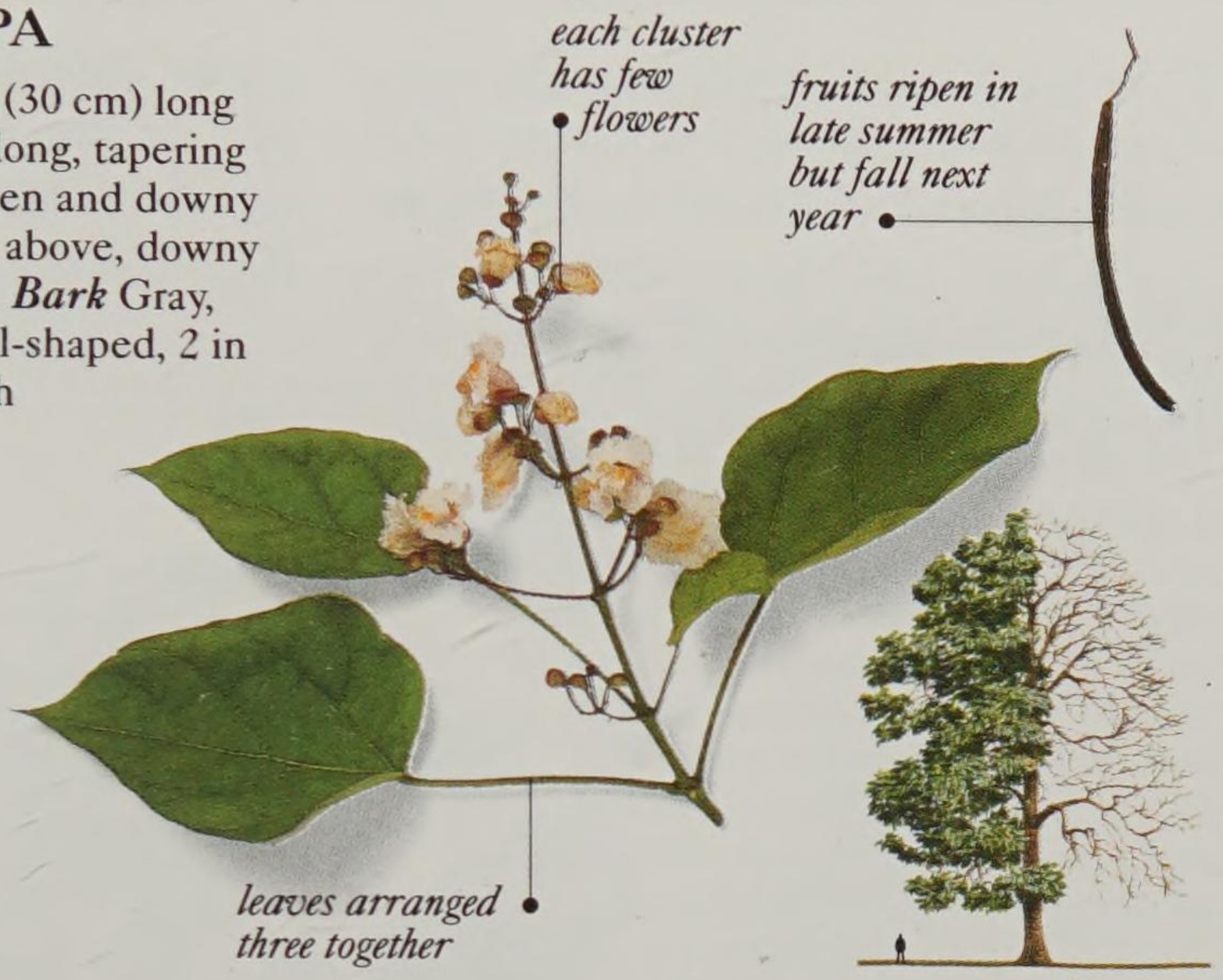
Family BIGNONIACEAE	Species *Catalpa speciosa*	Author (Warder ex Barney) Engelmann

WESTERN CATALPA

Leaves Broadly ovate, to 12 in (30 cm) long and 8 in (20 cm) across, with a long, tapering point at the tip, glossy dark green and downy when young becoming smooth above, downy beneath, carried on long stalks. ***Bark*** Gray, scaly and fissured. ***Flowers*** Bell-shaped, 2 in (5 cm) long, white, spotted with yellow and some purple, borne in large panicles in summer. ***Fruit*** Slender, beanlike, and hanging, to 18 in (45 cm) long, persisting until the following year.

• **NATIVE REGION** United States.

• **HABITAT** Riverbanks, damp woods, and swamps.



Height 130 ft (40 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

BUXACEAE

THE PLANT KNOWN AS THE common box *(Buxus sempervirens)* is the most familiar tree in this family, which contains four or five genera, with some 60 species of evergreen trees, shrubs, and the occasional herbaceous plant. They usually have opposite leaves, and small flowers borne in clusters.

Family BUXACEAE	Species *Buxus sempervirens*	Author Linnaeus

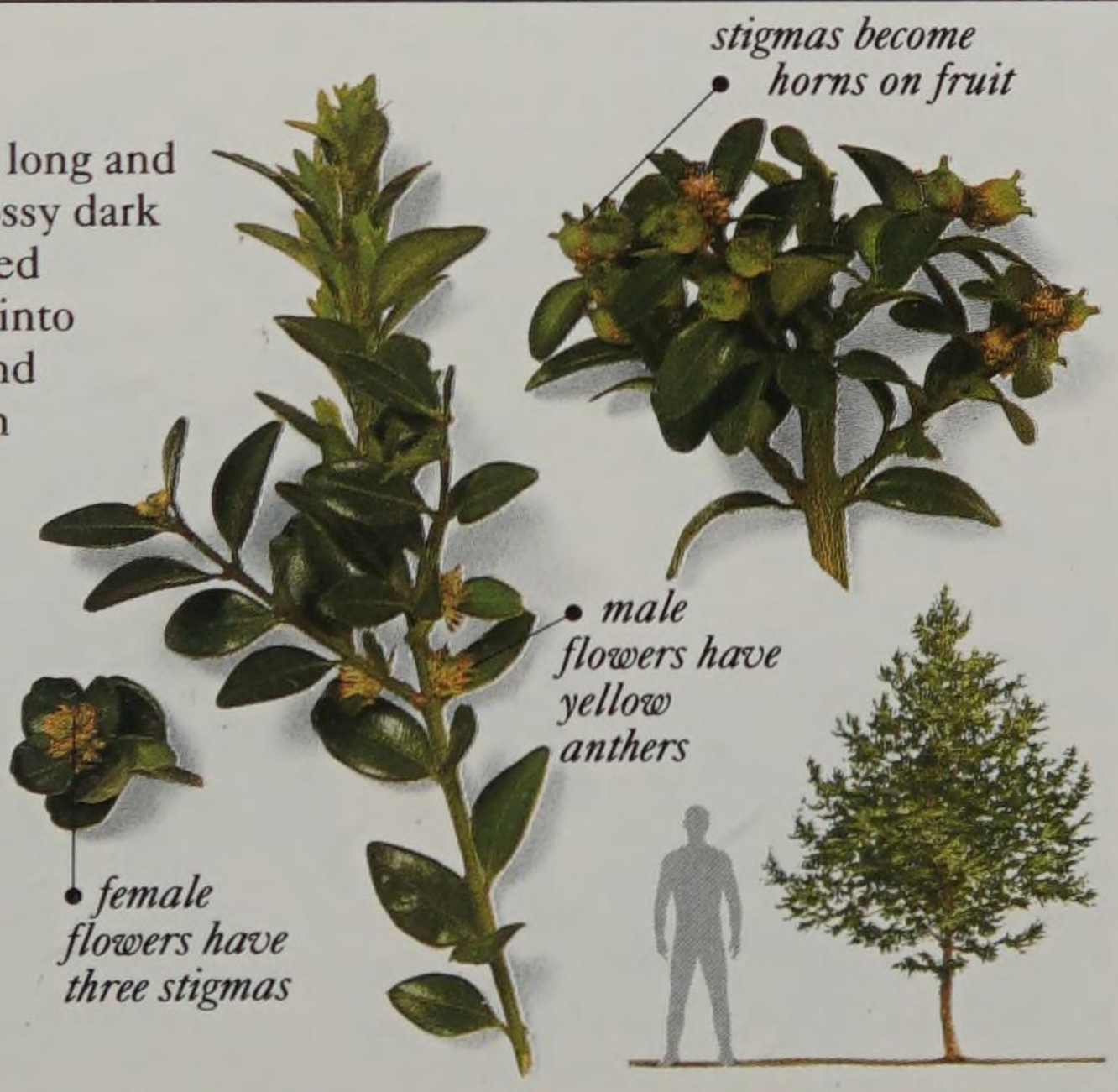
COMMON BOX

Leaves Ovate to oblong, to 1 in (2.5 cm) long and ⅜ in (1 cm) across, notched at the tip, glossy dark green above, paler beneath, on four-angled shoots. ***Bark*** Gray and smooth, cracking into small squares with age. ***Flowers*** Males and females both small and green, males with conspicuous yellow anthers, separate but in the same cluster, in the leaf axils in early spring. ***Fruit*** A small, woody, green capsule, to 5/16 in (8 mm) long.

• **NATIVE REGION** N. Africa, S.W. Asia, Europe.

• **HABITAT** Usually alkaline soil.

• **REMARK** Can be either a small tree or a large shrub, producing a very hard, close-grained, yellow wood. In cultivation, it is traditionally used as a hedging plant and for topiary.



Height 20 ft (6 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

CELASTRACEAE

THIS WIDESPREAD FAMILY contains nearly 100 genera and over 1,000 species of evergreen and deciduous trees, shrubs, and climbing plants. The leaves are opposite or alternate, and the flowers usually small and greenish.

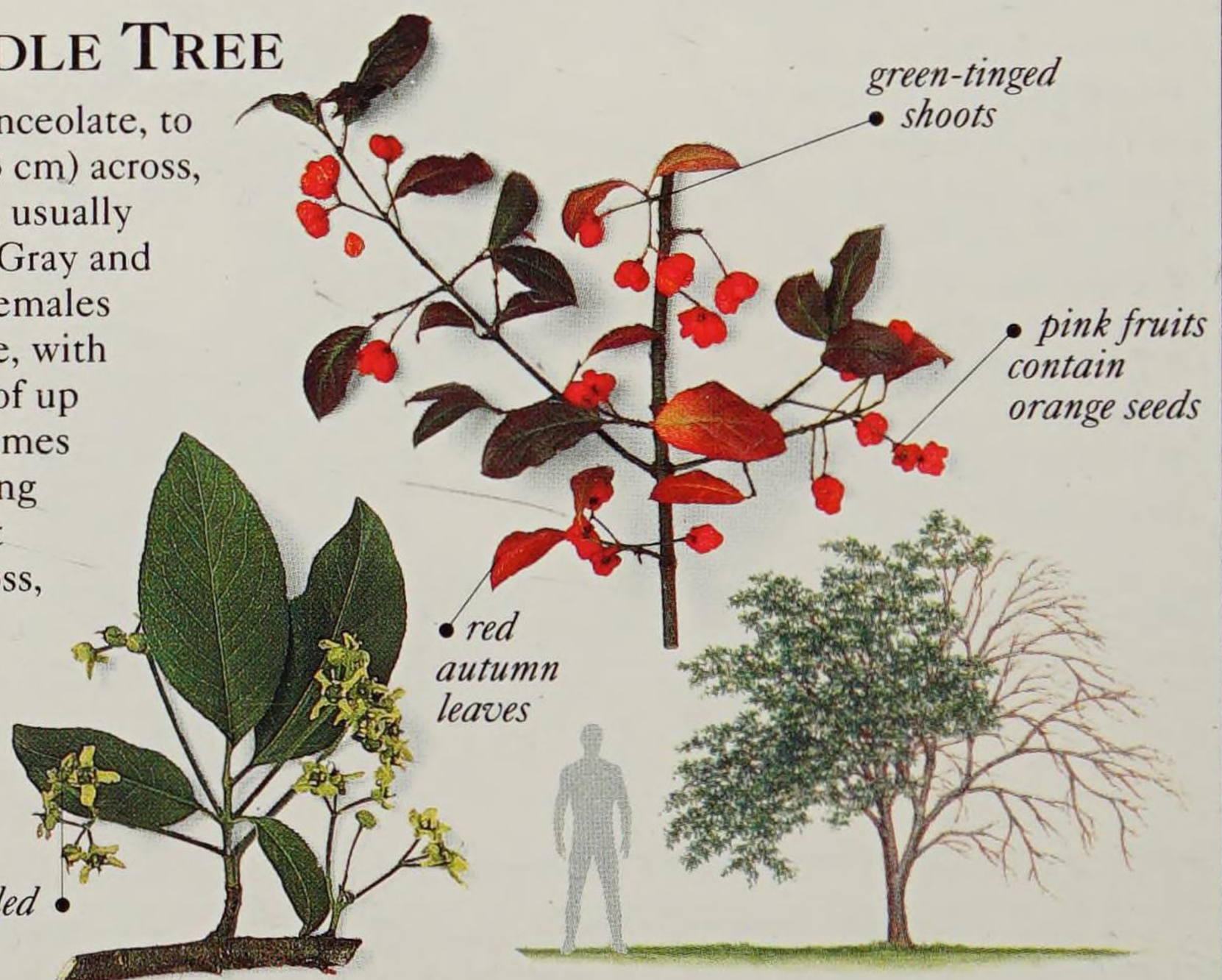
Family CELASTRACEAE	Species *Euonymus europaeus*	Author Linnaeus

EUROPEAN SPINDLE TREE

Leaves Elliptic to ovate or lanceolate, to 3¼ in (8 cm) long and 1¼ in (3 cm) across, taper-pointed, finely toothed, usually turning red in autumn. ***Bark*** Gray and smooth. ***Flowers*** Males and females both small and greenish white, with four petals, borne in clusters of up to ten in the leaf axils, sometimes on separate plants in late spring to early summer. ***Fruit*** Bright pink, about ½ in (1.2 cm) across, the four lobes opening to reveal bright orange-coated seeds.

• **NATIVE REGION**
W. Asia, Europe.

• **HABITAT**
Woods, thickets, and hedgerows.



Height 20 ft (6 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

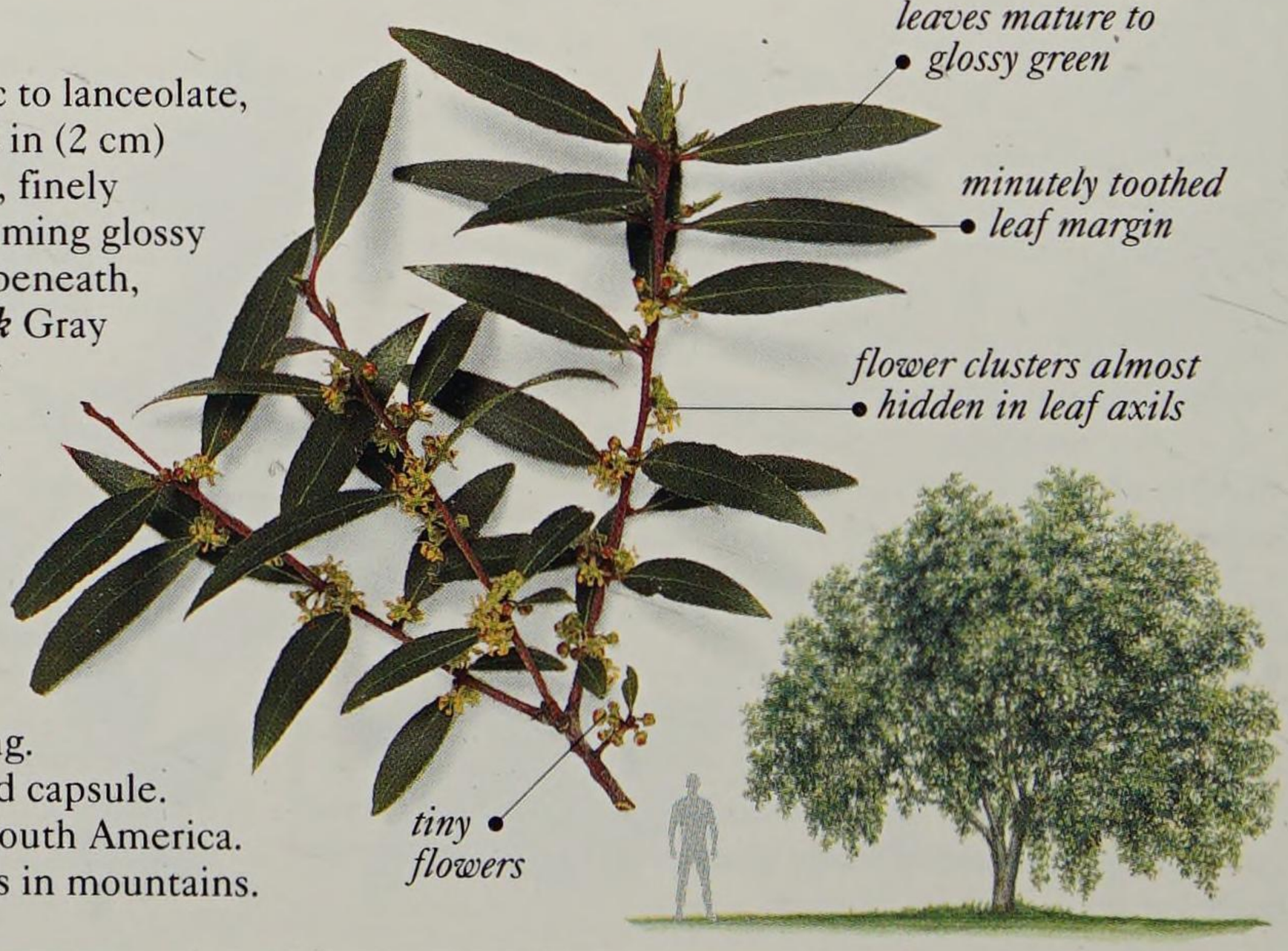
Family CELASTRACEAE	Species *Maytenus boaria*	Author Molina

MAYTEN

Leaves Narrowly elliptic to lanceolate, to 2 in (5 cm) long and ¾ in (2 cm) across, pointed at the tip, finely toothed, pale green becoming glossy dark green above, paler beneath, on drooping shoots. ***Bark*** Gray and smooth, with narrow vertical fissures, peeling at the base; orange when freshly exposed. ***Flowers*** Very small and pale green, with yellow anthers, borne in clusters in the leaf axils in mid- to late spring. ***Fruit*** A small, orange-red capsule.

• **NATIVE REGION** South America.

• **HABITAT** Open areas in mountains.



Height 65 ft (20 m)	Shape Broadly weeping	Leaf persistence Evergreen	Leaf type

CERCIDIPHYLLACEAE

THE SPECIES DESCRIBED here is the only member of this family. It was once thought to be related to the magnolias *(Magnolia*, see pp.202–215) and was classified with them, but is now regarded as a plant of primitive origin, and more closely related to the planes *(Platanus*, see pp.234–235).

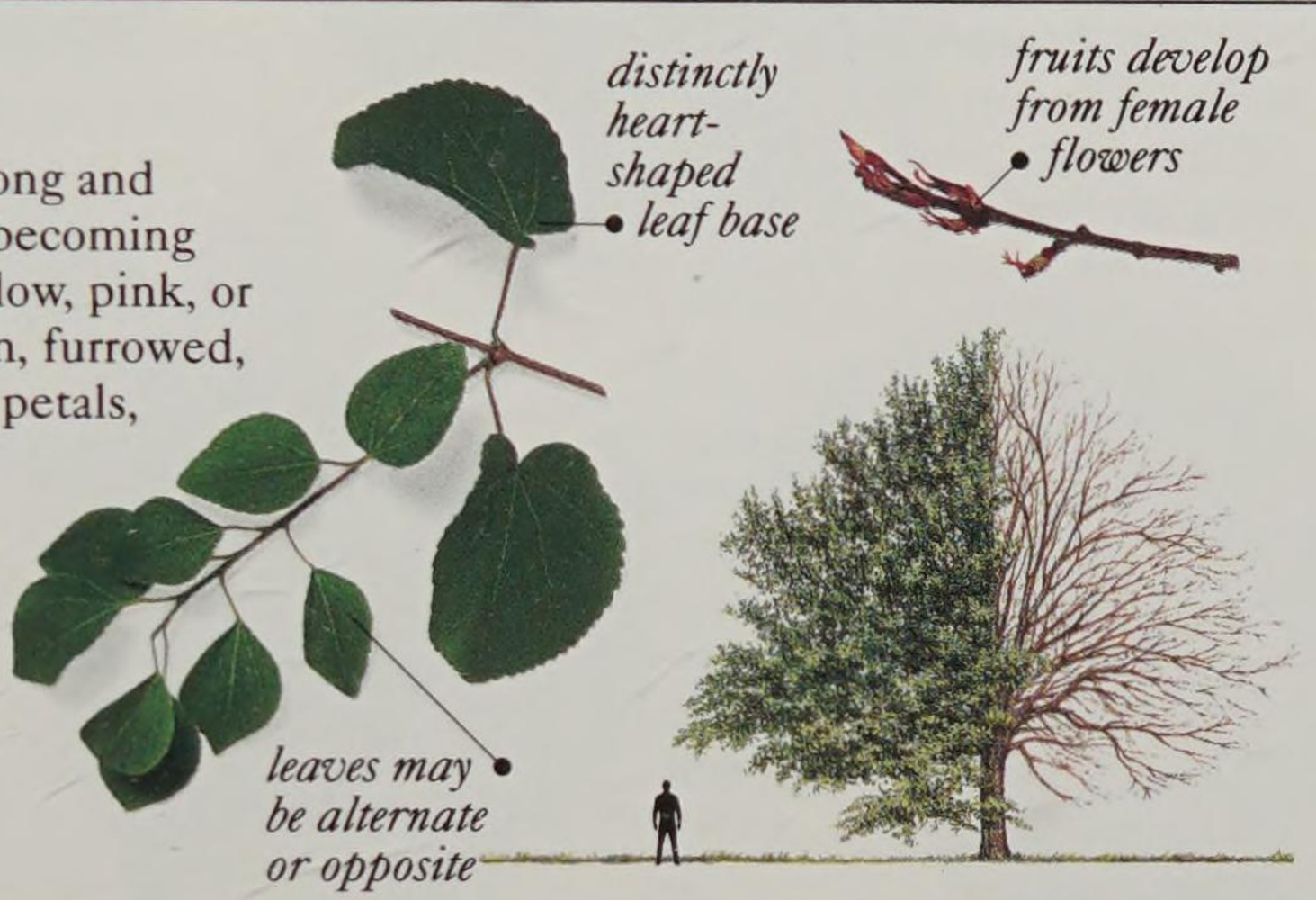
Family CERCIDIPHYLLACEAE	Species *Cercidiphyllum japonicum*	Author Siebold & Zuccarini

KATSURA TREE

Leaves Rounded, to 3 in (7.5 cm) long and across, with rounded teeth, bronze becoming blue-green and smooth, turning yellow, pink, or purple in autumn. ***Bark*** Gray-brown, furrowed, flaking. ***Flowers*** Small and without petals, males with numerous red stamens, females with four to six red styles, borne in the leaf axils, on separate plants in early spring. ***Fruit*** A small, curved, green pod.

• **NATIVE REGION**
The Himalayas to Japan.

• **HABITAT** Mountain forests.



Height 100 ft (30 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

CORNACEAE

THIS FAMILY HAS about 12 genera and 100 species of evergreen and deciduous trees and shrubs, and includes the dogwoods *(Cornus*, see pp.133–138); most grow in northern temperate regions. Leaves are usually opposite. The small flowers may be surrounded by conspicuous bracts.

Family CORNACEAE	Species *Cornus alternifolia*	Author Linnaeus f.

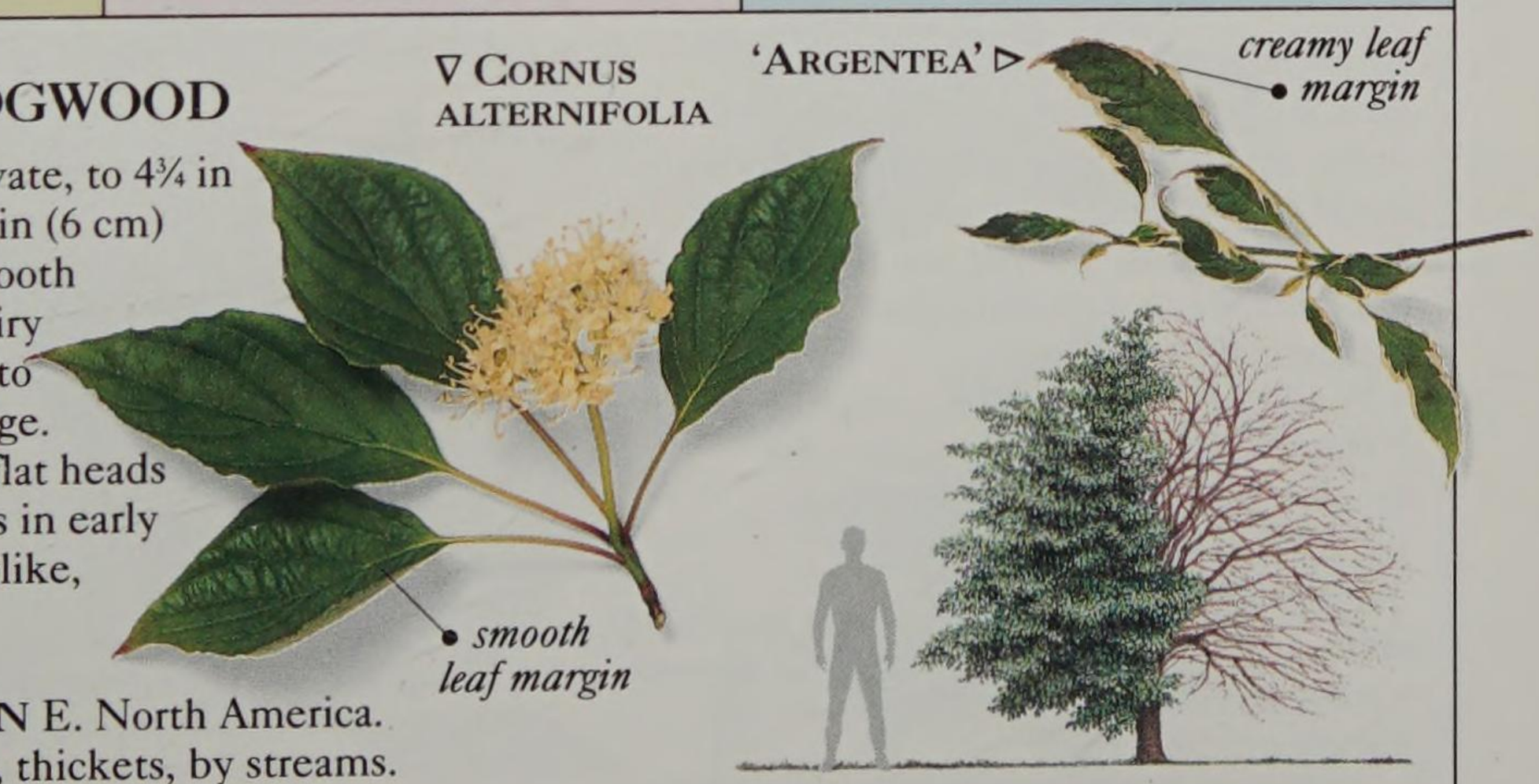
PAGODA DOGWOOD

▽ CORNUS ALTERNIFOLIA 'ARGENTEA' ▷

Leaves Elliptic to ovate, to 4¾ in (12 cm) long and 2½ in (6 cm) across, green and smooth above, bluish and hairy beneath. ***Bark*** Gray to brown, ridged with age. ***Flowers*** Creamy, in flat heads to 2½ in (6 cm) across in early summer. ***Fruit*** Berrylike, blue-black, to ¼ in (6 mm) across.

• **NATIVE REGION** E. North America.

• **HABITAT** Woods, thickets, by streams.



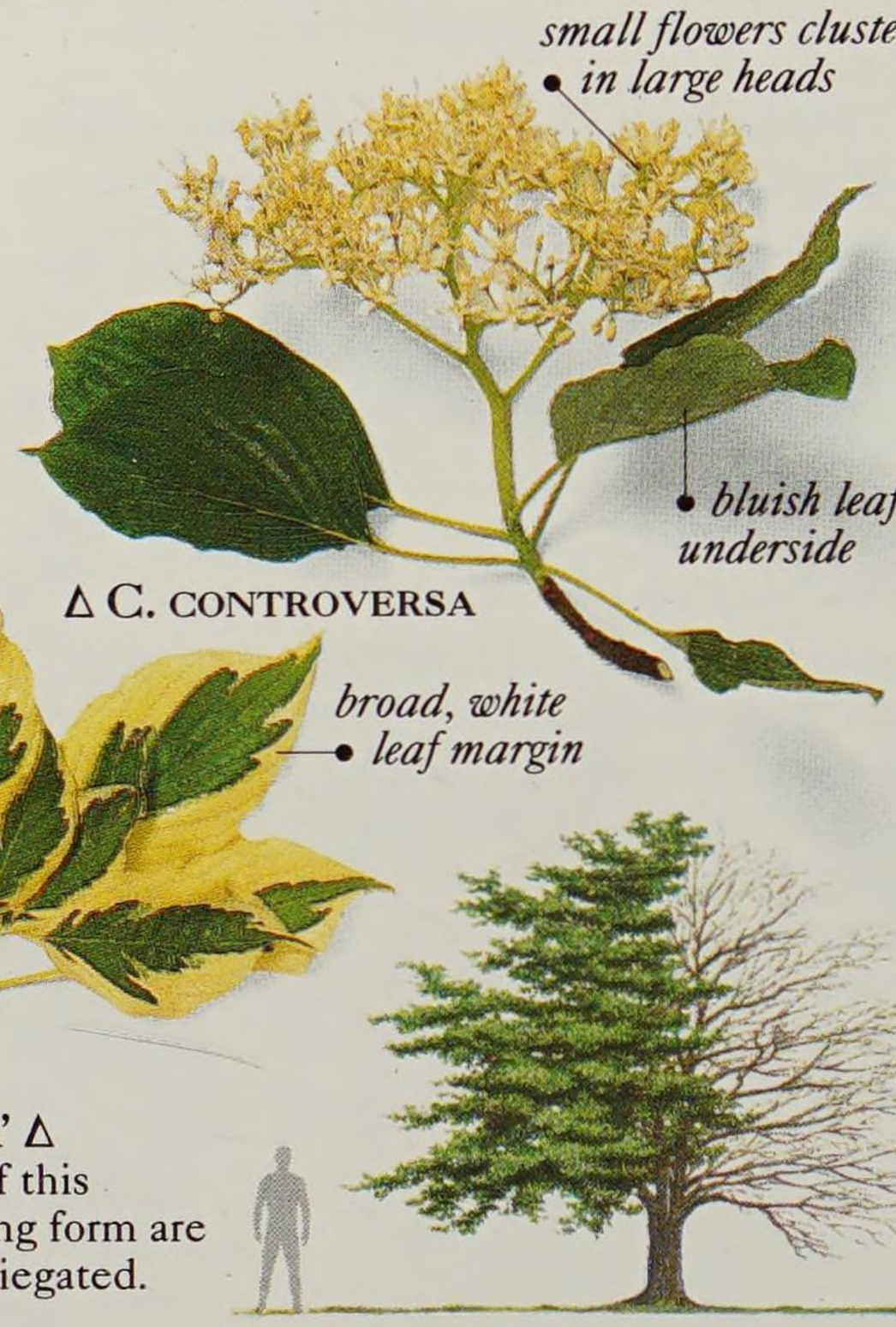
Height 20 ft (6 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family CORNACEAE	Species *Cornus controversa*	Author Hemsley

GIANT DOGWOOD

Leaves Ovate to elliptic, to 6 in (15 cm) long and 3 in (7.5 cm) across, taper-pointed, untoothed, glossy dark green and smooth above, blue-green beneath, turning purple in autumn, carried on long, slender stalks, clustered at the tips of the shoots. ***Bark*** Smooth, gray, becoming fissured with age. ***Flowers*** Small and creamy white, with four petals, borne in flattened heads to 6 in (15 cm) across, along distinctly layered branches in early to midsummer. ***Fruit*** A small, rounded, blue-black berry.

- **NATIVE REGION** E. Asia.
- **HABITAT** Woods and thickets.
- **REMARK** This species and the much smaller *Cornus alternifolia* (see p.133) are the only two dogwoods that bear their leaves alternately, rather than opposite. In Japan, wooden dolls are often made from the wood of this tree.



Δ C. CONTROVERSA

'VARIEGATA' Δ The leaves of this slower-growing form are strikingly variegated.

Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family CORNACEAE	Species *C.* 'Eddie's White Wonder'	Author None

CORNUS 'EDDIE'S WHITE WONDER'

Leaves Broadly elliptic, to 4¾ in (12 cm) long, with an abruptly pointed tip, slightly glossy above, gray and hairy beneath, turning orange, red, and purple in autumn. ***Bark*** Gray and smooth, with few slender, pale stripes. ***Flowers*** Individually small and greenish, numerous, borne in dense, hemispherical clusters, each cluster surrounded by four white or slightly pink-tinged bracts, the bracts not joined at the tip at first, emerging in late spring at the same time as the young leaves. ***Fruit*** Individually small and red, in hemispherical clusters, the fruits separating when ripe.

- **NATIVE REGION** Of garden origin.
- **REMARK** A hybrid between the flowering dogwood *(Cornus florida,* see p.135) and the Pacific dogwood *(Cornus nuttallii,* see p.137). Individual specimens do not always produce fruit.

Height 40 ft (12 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family CORNACEAE	Species *Cornus florida*	Author Linnaeus

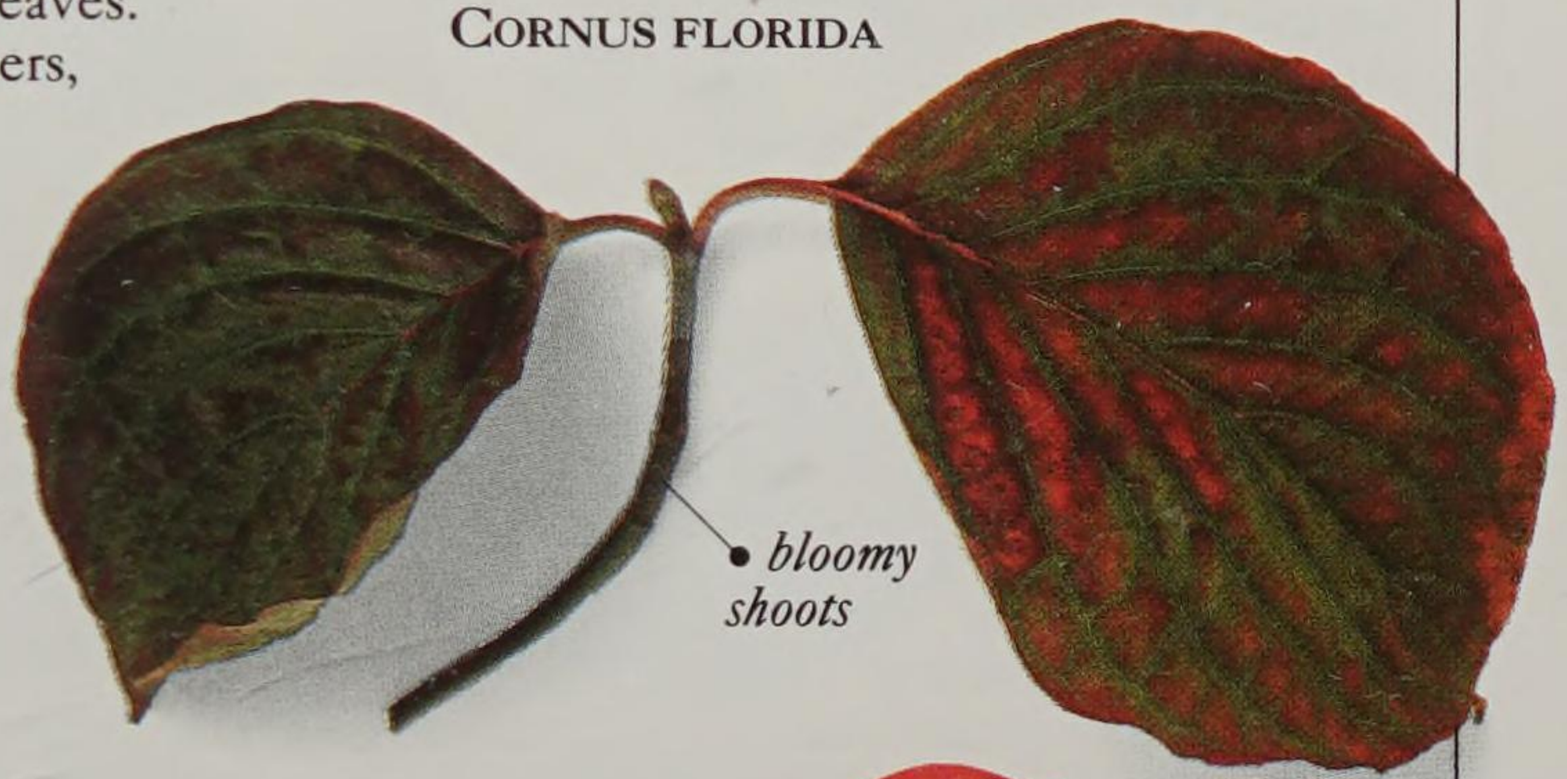
FLOWERING DOGWOOD

Leaves Ovate to elliptic, to 4 in (10 cm) long and 2½ in (6 cm) across, taper-pointed, untoothed, dark green and smooth above, whitish and softly hairy beneath, turning red in autumn, carried on bloomy shoots. ***Bark*** Red-brown to blackish, deeply cracked into small, square plates. ***Flowers*** Small and greenish, numerous, in dense, hemispherical clusters, each cluster surrounded by four white to deep pink bracts, each bract notched at the tip, visible in bud during winter, opening in late spring before or with the young leaves. ***Fruit*** Individually small, red, in clusters, the fruits separating when ripe.

• **NATIVE REGION**
E. North America.

• **HABITAT** Acid soil in woods.

CORNUS FLORIDA



notch at tip where bracts were once joined

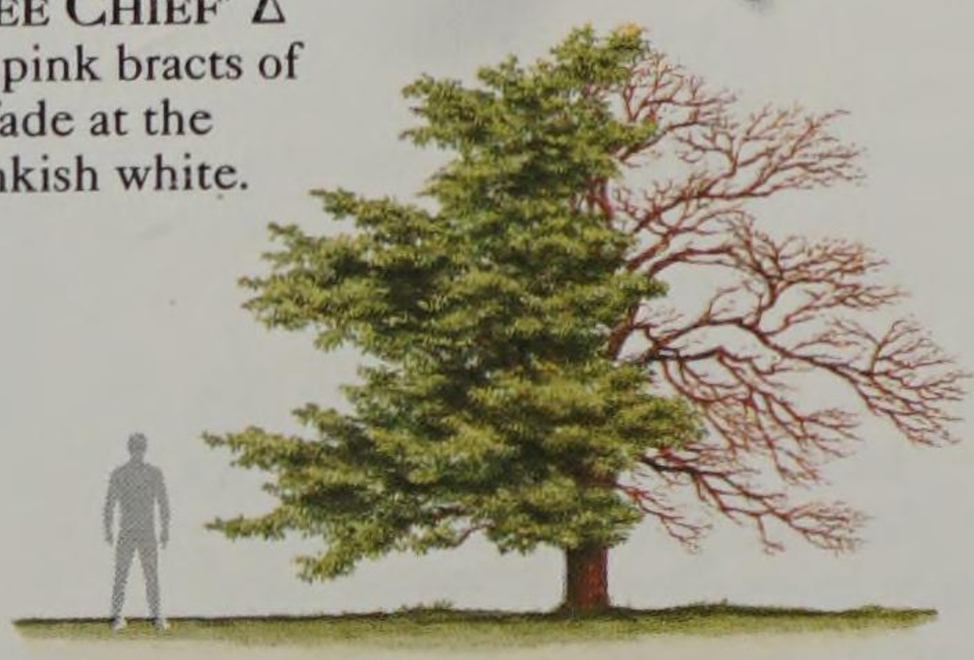
large, pure white bracts

untoothed leaf margin

green flowers borne in tight clusters

Δ 'WHITE CLOUD'
This selected form is distinguished by the broad, white bracts that surround the green flowers.

'CHEROKEE CHIEF' Δ
The deep pink bracts of this form fade at the base to pinkish white.



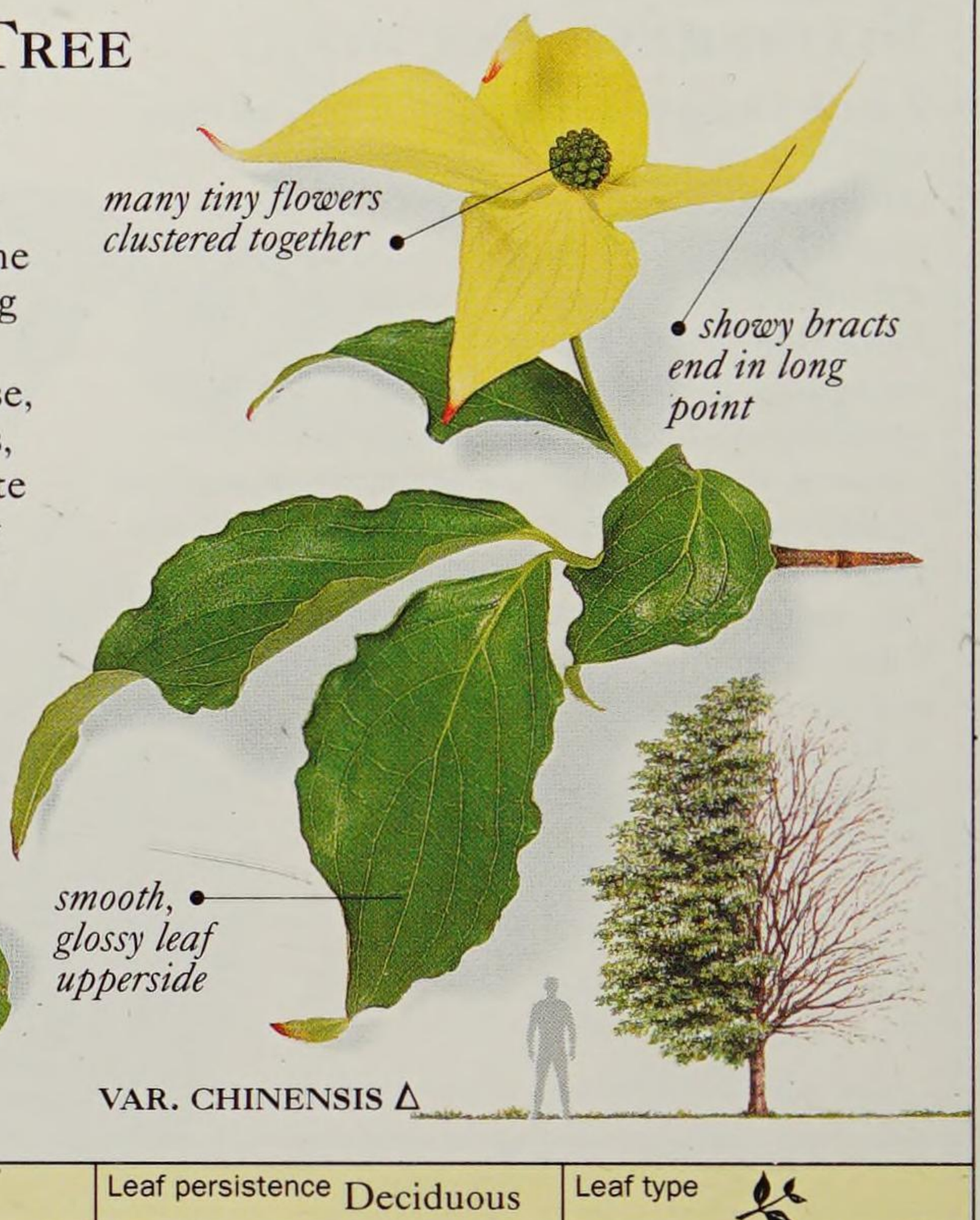
Height 40 ft (12 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family CORNACEAE	Species *Cornus kousa*	Author Hance

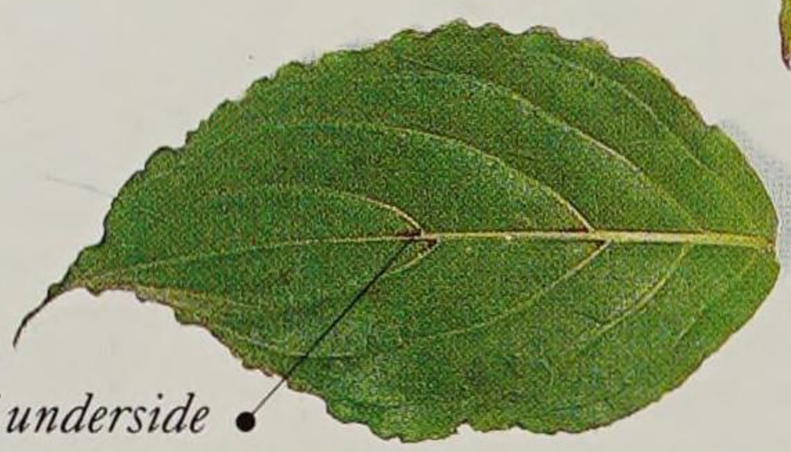
JAPANESE STRAWBERRY TREE

Leaves Ovate, to 3 in (7.5 cm) long and 2 in (5 cm) across, taper-pointed, with a wavy margin, untoothed, dark green and smooth above, smooth with tufts of brown hairs in the vein axils beneath. ***Bark*** Red-brown, peeling in irregular plates with age. ***Flowers*** Tiny, yellow-white or greenish, numerous, in dense, hemispherical, long-stalked, upright clusters, each cluster surrounded by four creamy white or pink-tinged, taper-pointed bracts, in early summer. ***Fruit*** Individually small, clustered together in a fleshy, strawberrylike, edible, red, pendulous head.

- **NATIVE REGION** Japan.
- **HABITAT** Mountain woods.



CORNUS KOUSA ▷



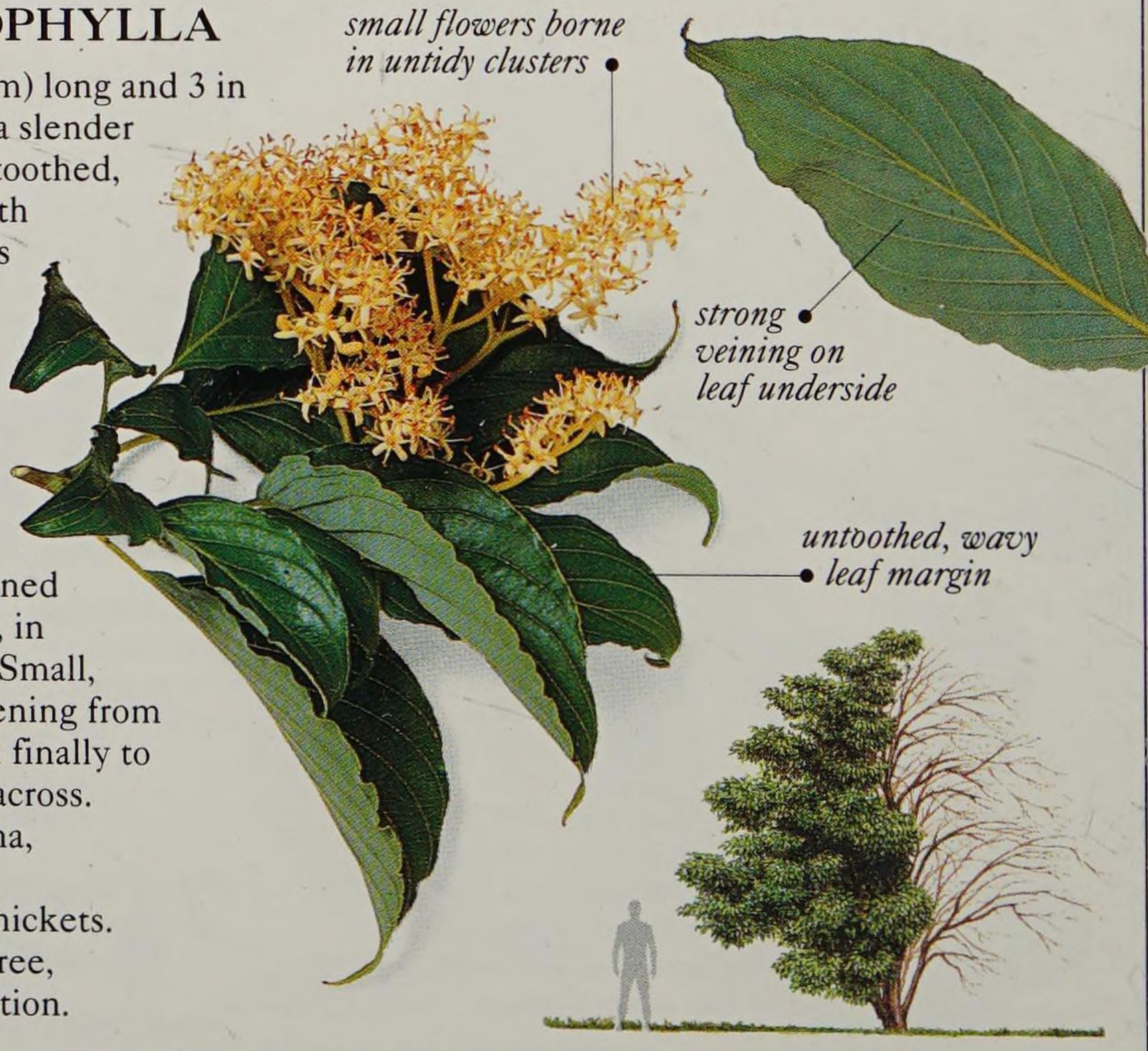
Height 50 ft (15 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family CORNACEAE	Species *Cornus macrophylla*	Author Wallich

CORNUS MACROPHYLLA

Leaves Ovate, to 6 in (15 cm) long and 3 in (7.5 cm) across, tapering to a slender tip, with a wavy margin, untoothed, glossy dark green and smooth above, with up to eight pairs of veins either side of the midrib, bluish green and thinly hairy beneath. ***Bark*** Dark gray, becoming fissured with age. ***Flowers*** Small and creamy white, with four petals, borne in loose, flattened heads to 6 in (15 cm) across, in mid- to late summer. ***Fruit*** Small, rounded, and berrylike, ripening from green to reddish purple and finally to blue-black, to ¼ in (6 mm) across.

- **NATIVE REGION** China, Himalayas, Japan.
- **HABITAT** Forests and thickets.
- **REMARK** A handsome tree, little known even in cultivation.



Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

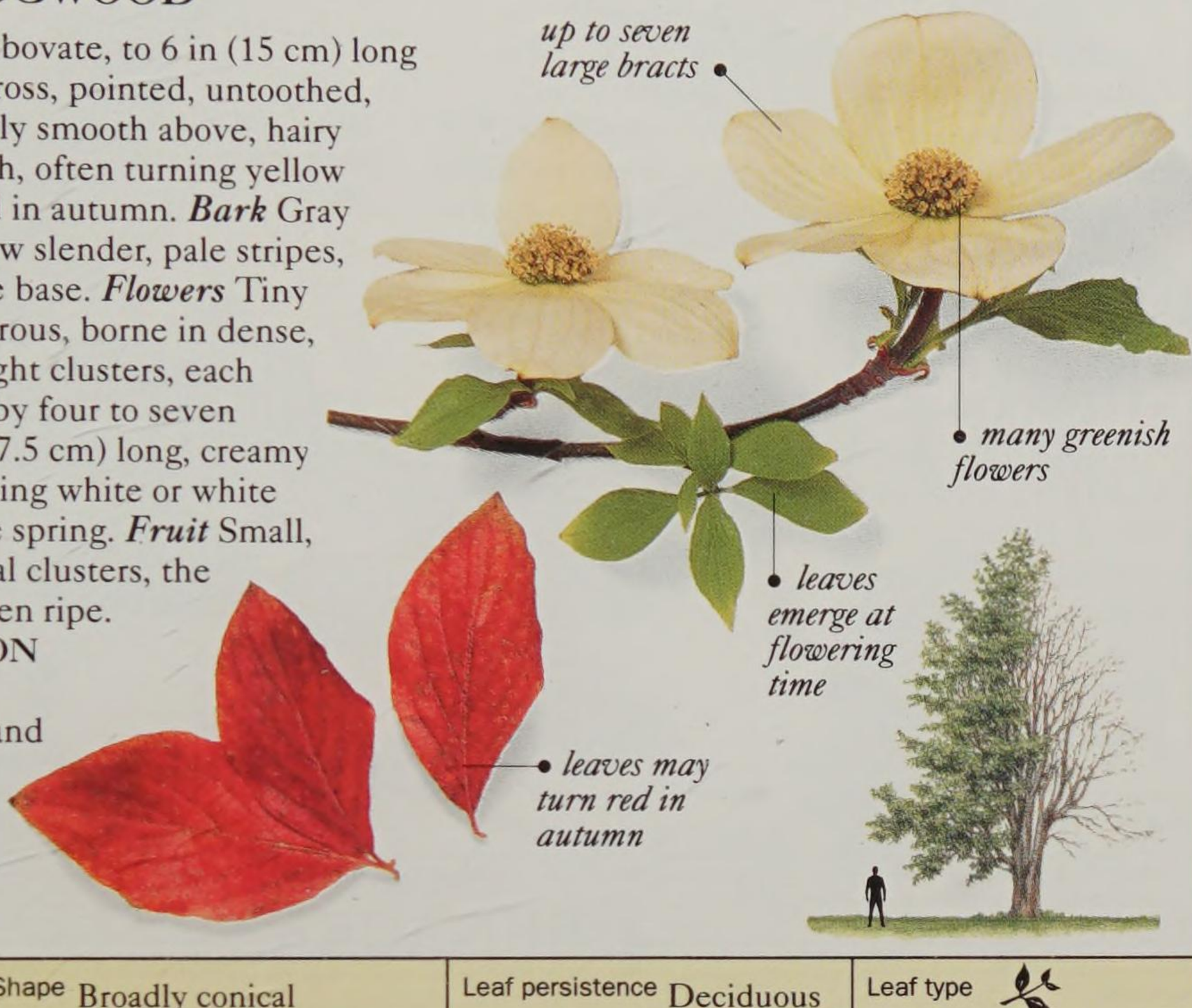
Family CORNACEAE	Species *Cornus nuttallii*	Author Audubon

PACIFIC DOGWOOD

Leaves Elliptic to obovate, to 6 in (15 cm) long and 3 in (7.5 cm) across, pointed, untoothed, dark green and nearly smooth above, hairy when young beneath, often turning yellow and occasionally red in autumn. ***Bark*** Gray and smooth, with few slender, pale stripes, slightly fluted at the base. ***Flowers*** Tiny and greenish, numerous, borne in dense, hemispherical, upright clusters, each cluster surrounded by four to seven large bracts to 3 in (7.5 cm) long, creamy white at first becoming white or white flushed pink, in late spring. ***Fruit*** Small, red, in hemispherical clusters, the fruits separating when ripe.

• **NATIVE REGION**
W. North America.

• **HABITAT** Lowland forests, and on mountains in the south of its native region.



Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

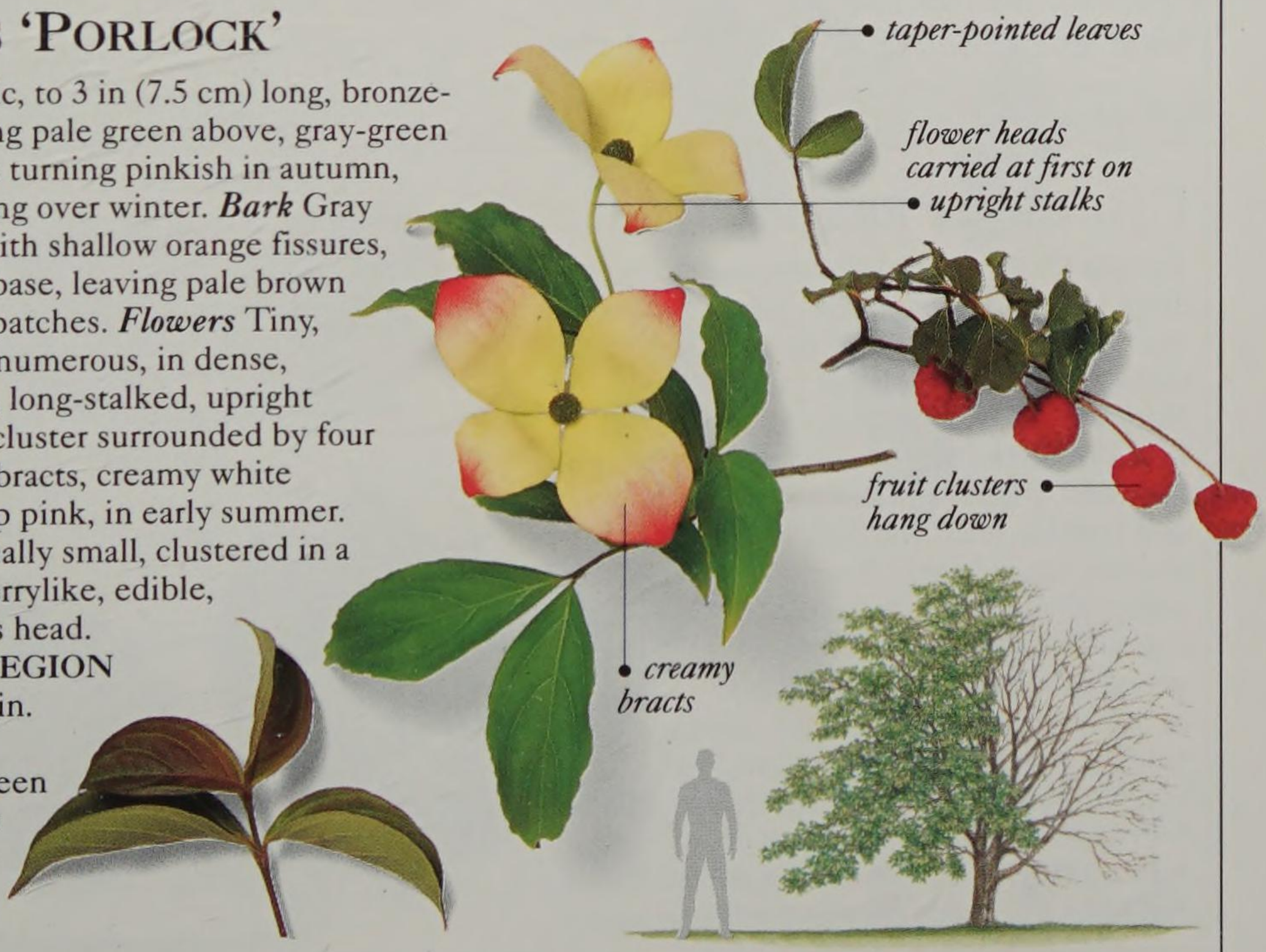
Family CORNACEAE	Species *Cornus* 'Porlock'	Author None

CORNUS 'PORLOCK'

Leaves Elliptic, to 3 in (7.5 cm) long, bronze-green becoming pale green above, gray-green beneath, some turning pinkish in autumn, others persisting over winter. ***Bark*** Gray and smooth, with shallow orange fissures, flaking at the base, leaving pale brown and pale gray patches. ***Flowers*** Tiny, yellow-white, numerous, in dense, hemispherical, long-stalked, upright clusters, each cluster surrounded by four taper-pointed bracts, creamy white becoming deep pink, in early summer. ***Fruit*** Individually small, clustered in a fleshy, strawberrylike, edible, red, pendulous head.

• **NATIVE REGION**
Of garden origin.

• **REMARK**
A hybrid between *Cornus capitata* and *Cornus kousa* (see p.136).



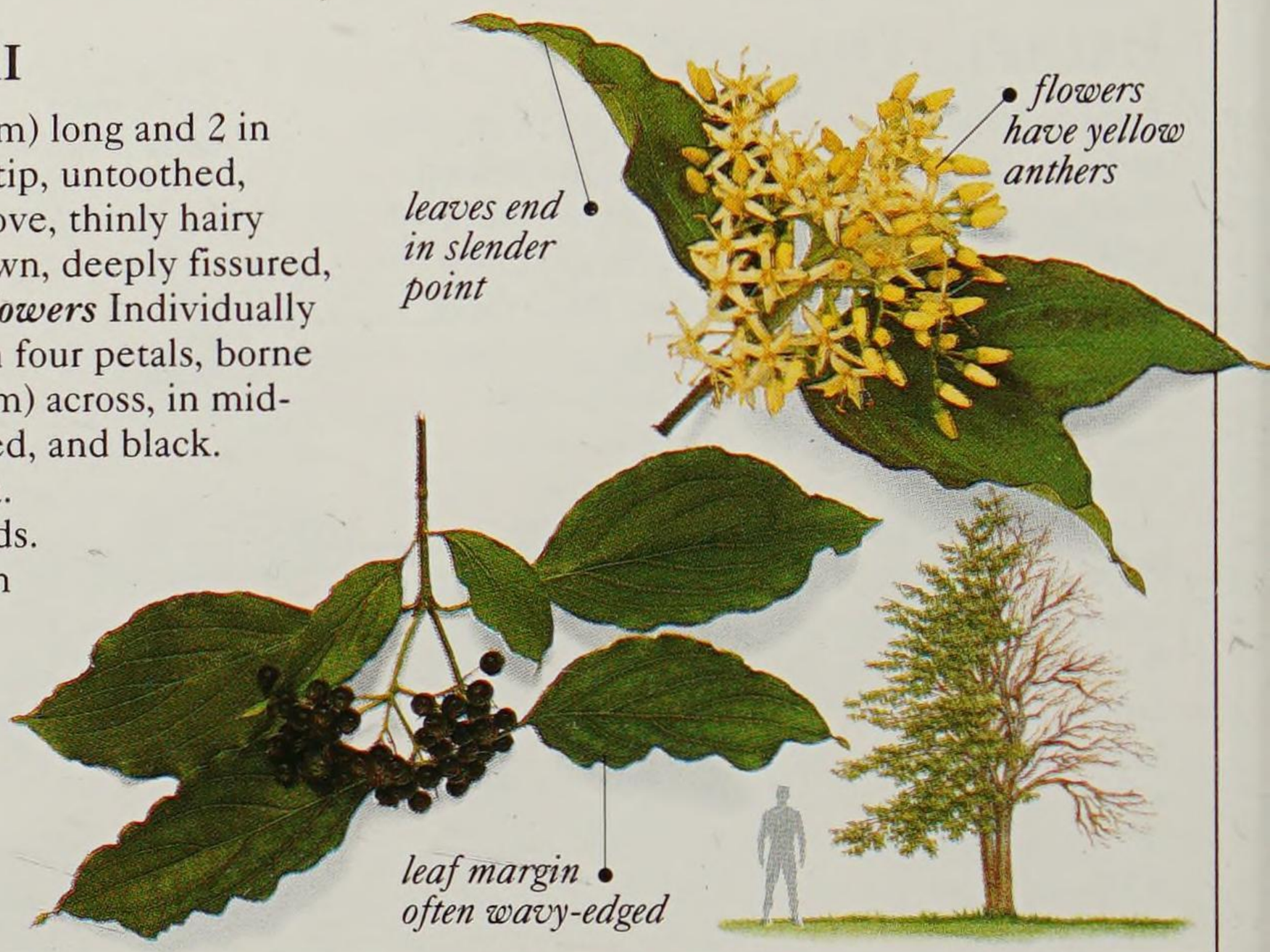
Height 26 ft (8 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family CORNACEAE	Species *Cornus walteri*	Author Wangerin

CORNUS WALTERI

Leaves Elliptic, to 4 in (10 cm) long and 2 in (5 cm) across, tapered at the tip, untoothed, slightly glossy dark green above, thinly hairy beneath. ***Bark*** Pale gray-brown, deeply fissured, with narrow, corky, ridges. ***Flowers*** Individually small and creamy white, with four petals, borne in flattened heads 3 in (7.5 cm) across, in mid-summer. ***Fruit*** Small, rounded, and black.

- **NATIVE REGION** China.
- **HABITAT** Mountain woods.
- **REMARK** The species can be either a shrub or a small tree. It is uncommon in the wild and little known even in cultivation. In winter, the upperside of shoots exposed to the sun is purplish pink.



Height 40 ft (12 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

EBENACEAE

ABOUT 500 SPECIES are collected in the two genera of this family; nearly all are in the genus *Diospyros*. These evergreen and deciduous trees and shrubs, mainly of tropical origin, normally have alternate, untoothed leaves. Small male and female flowers are usually borne on separate plants.

Family EBENACEAE	Species *Diospyros kaki*	Author Linnaeus f.

CHINESE PERSIMMON

Leaves Ovate to obovate, to 6 in (15 cm) or more long and 3 in (7.5 cm) across, pointed at the tip, untoothed, glossy dark green and smooth or nearly so above, paler and usually hairy beneath, turning red or orange in autumn. ***Bark*** Pale gray and scaly, peeling to furrowed. ***Flowers*** Males and females small and bell-shaped, about ⅝ in (1.5 cm) long, yellow, males in clusters together, females singly, on young shoots, on separate plants in midsummer. ***Fruit*** A large, juicy, yellow to orange or red berry, to 3 in (7.5 cm) across, edible when ripe.

- **NATIVE REGION** Unknown.
- **HABITAT** Known only in cultivation.
- **REMARK** Fruits are also known as kaki.

Height 46 ft (14 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family EBENACEAE	Species *Diospyros lotus*	Author Linnaeus

DATE PLUM

Leaves Ovate to lanceolate, to 6 in (15 cm) long, pointed, untoothed, glossy dark green above, gray-green beneath, smooth or hairy on both sides. ***Bark*** Gray, smooth, fissured into square plates with age. ***Flowers*** Males and females both bell-shaped, about 3/16 in (1 cm) long, deep pink or orange-yellow, males in clusters, females singly, on the underside of the young shoots, on separate plants in mid-summer. ***Fruit*** An edible berry, 3/4 in (2 cm) across, green ripening to yellow-brown to blue-black, sometimes bloomy.

• **NATIVE REGION** S.W. Asia and N. Iran.

• **HABITAT** Woods.

• **REMARK** In its native region, the species is widely cultivated for its edible fruits.

Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family EBENACEAE	Species *Diospyros virginiana*	Author Linnaeus

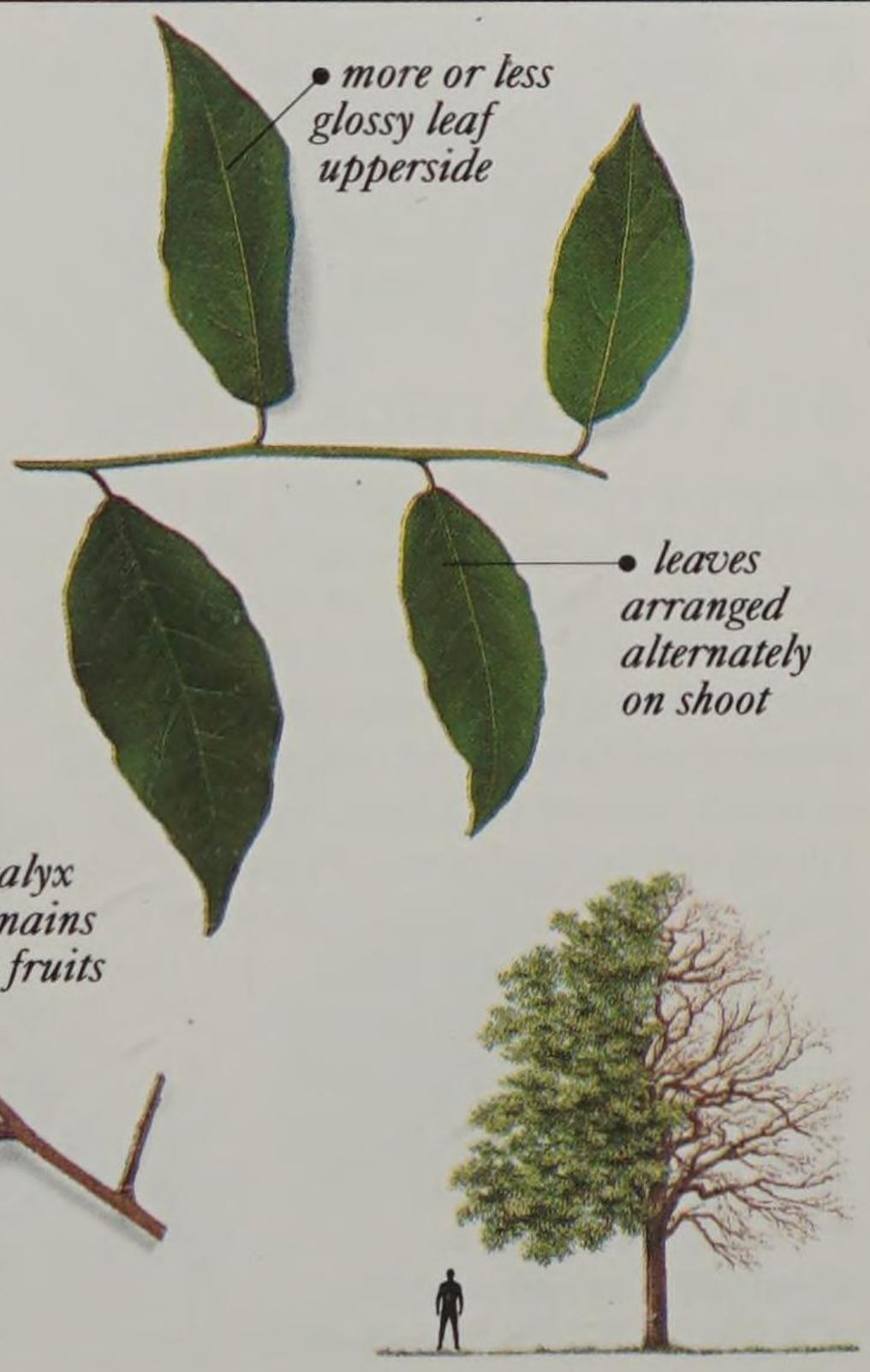
PERSIMMON

Leaves Ovate to oblong, to 4 3/4 in (12 cm) long and 3 in (7.5 cm) across, pointed, untoothed, dark often glossy green and smooth or nearly so above, gray-green and smooth or hairy beneath. ***Bark*** Dark brown to black, fissured into small, square plates. ***Flowers*** Males and females both bell-shaped, about 3/8 in (1 cm) long, yellow, males in clusters, females singly, along the young shoots, on separate plants in midsummer. ***Fruit*** An edible berry, to 1 1/2 in (4 cm) across, green ripening to yellowish red or orange-red.

• **NATIVE REGION** E. United States.

• **HABITAT** Woods and dry soil.

• **REMARK** Also known as possumwood.



Height 100 ft (30 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

ELAEAGNACEAE

THE OLEASTER FAMILY has three genera, with some 50 species of evergreen and deciduous small trees and shrubs spreading to all temperate northern regions. The plants are often spiny. The untoothed, usually scaly, leaves are opposite or alternate. Small, petalless male and female flowers may be borne on separate plants; in several species they develop into edible fruits.

Family ELAEAGNACEAE	Species *Elaeagnus angustifolia*	Author Linnaeus

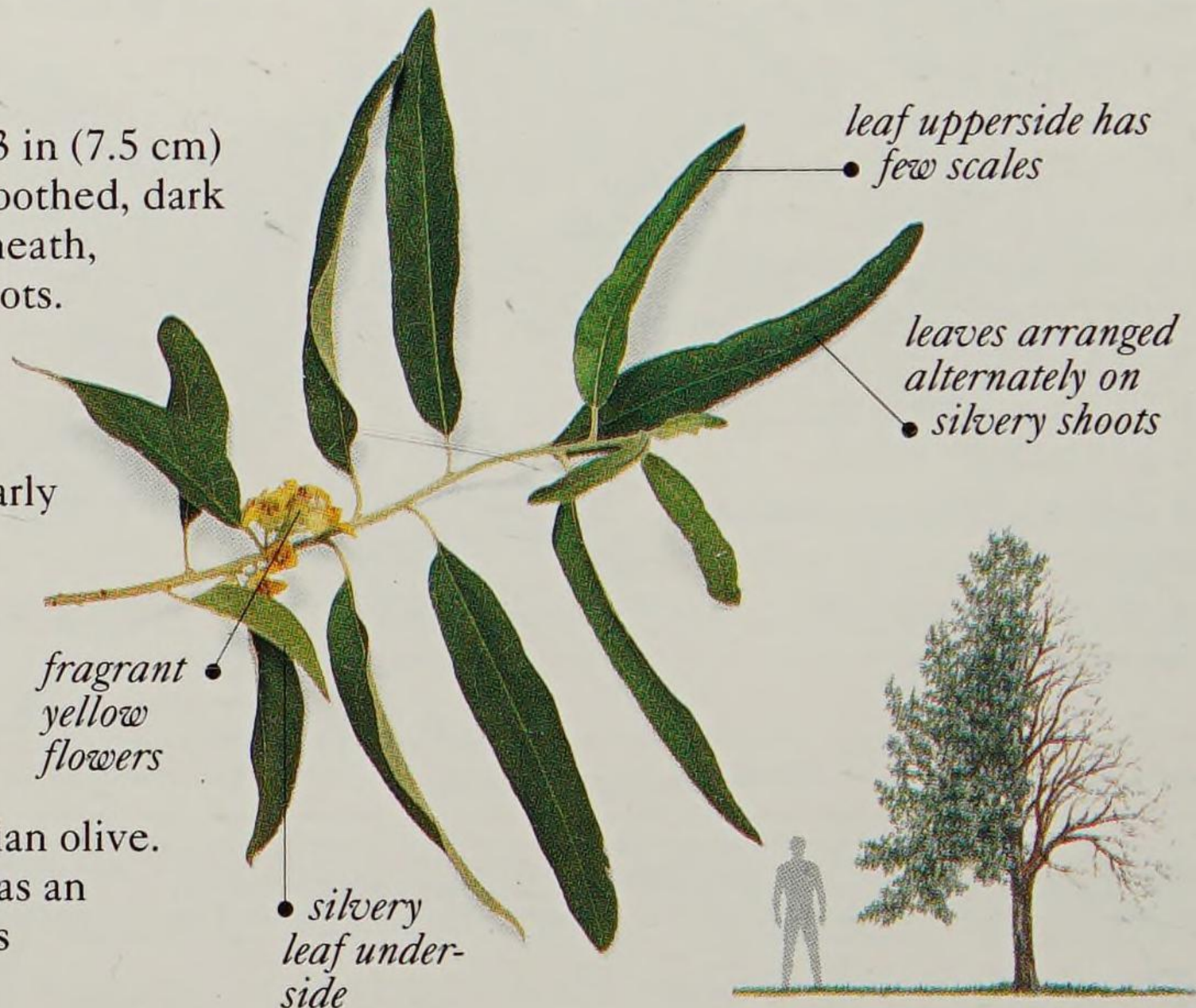
OLEASTER

Leaves Lanceolate to oblong, to 3 in (7.5 cm) long and ⅝ in (1.5 cm) across, untoothed, dark green above, silvery and scaly beneath, carried on silvery, often spiny, shoots. ***Bark*** Red-brown, rough and shredding. ***Flowers*** Small and yellow, fragrant, borne in clusters in the leaf axils in late spring to early summer. ***Fruit*** A sweet, edible, yellow berry, ⅜ in (1 cm) long, with silvery scales.

• **NATIVE REGION** W. Asia.

• **HABITAT** Coasts, riverbanks, dry riverbeds, and floodplains.

• **REMARK** Also known as Russian olive. In its native region, this species has an important commercial value for its fruits and its timber.



Height 40 ft (12 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family ELAEAGNACEAE	Species *Hippophae rhamnoides*	Author Linnaeus

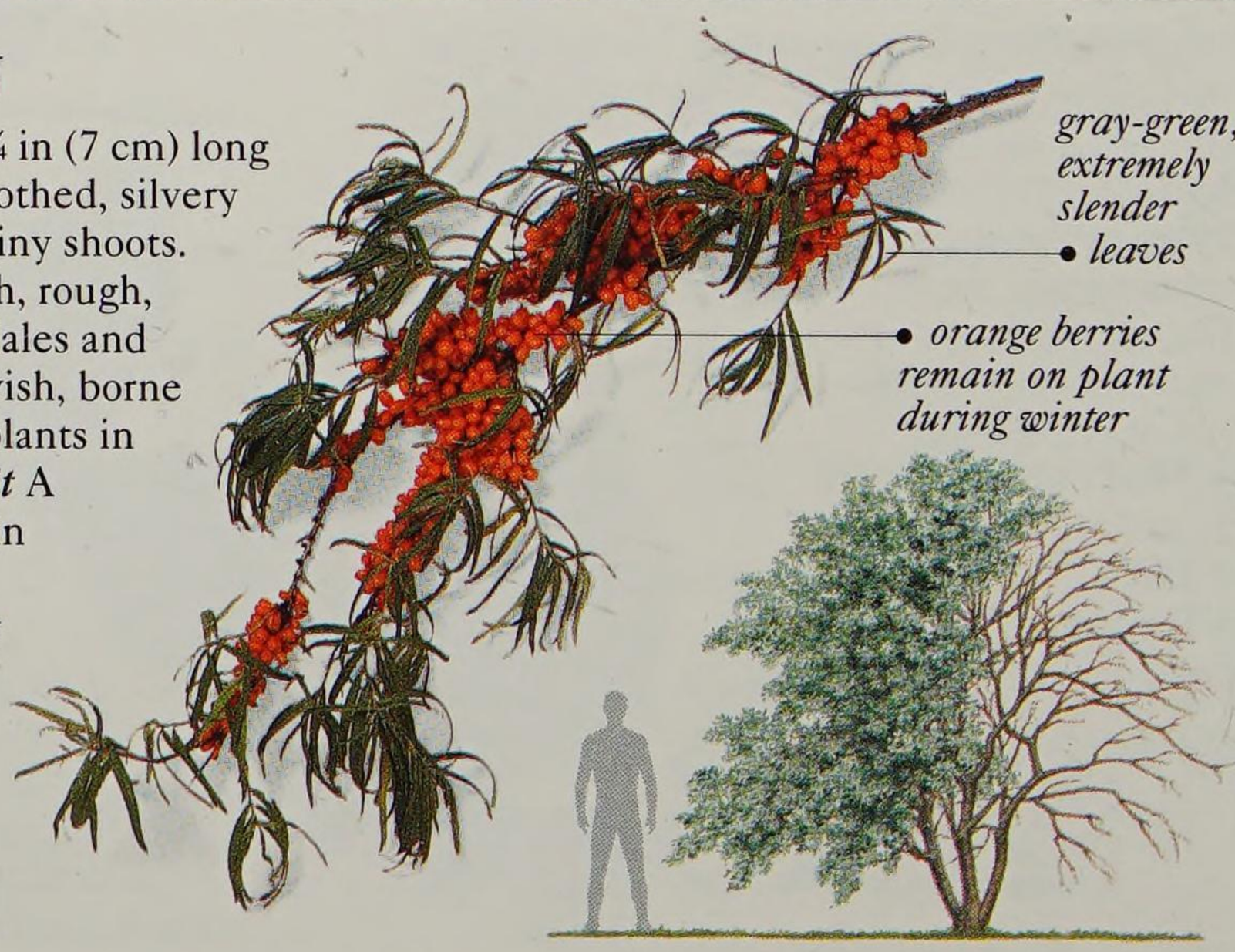
SEA BUCKTHORN

Leaves Narrowly linear, to 2¾ in (7 cm) long and ⅝ in (1.5 cm) across, untoothed, silvery and scaly on both sides, on spiny shoots. ***Bark*** Green-brown to blackish, rough, vertically fissured. ***Flowers*** Males and females very small and yellowish, borne in small clusters on separate plants in spring before the leaves. ***Fruit*** A bright orange berry, about 5/16 in (8 mm) long, borne in dense clusters on the shoots, usually persisting over winter.

• **NATIVE REGION** Asia, Europe.

• **HABITAT** Coasts, riverbanks, sandy woods.

• **REMARK** Can be a shrub.



Height 10 ft (3 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

ERICACEAE

THE HEATHER FAMILY, with about 100 genera and some 3,000 species, occurs almost worldwide: it is of restricted distribution only in Australia. The plants are mostly evergreen and deciduous trees and shrubs, with usually alternate leaves. The flowers vary in shape and size, but normally have five petals, joined at least at the base. In all members of the family, a root-associated fungus assists the plant in absorbing nutrients.

Family ERICACEAE	Species *Arbutus andrachne*	Author Linnaeus

GREEK STRAWBERRY TREE

Leaves Elliptic to obovate, to 4 in (10 cm) long and 2 in (5 cm) across, usually entire but sometimes toothed, especially on vigorous shoots, glossy dark green above, paler beneath, smooth. ***Bark*** Red-brown, peeling in thin strips; orange-brown when freshly exposed. ***Flowers*** Urn-shaped and small, to about ¼ in (6 mm) long, greenish at first opening white, on a short stalk, borne in upright clusters to 4 in (10 cm) long and across, at the ends of the shoots in early spring. ***Fruit*** A nearly smooth, rounded, orange-red, berry, ⅜ in (1 cm) across.

• **NATIVE REGION** S.E. Europe to S.W. Asia.

• **HABITAT** Woods, thickets, and rocky slopes.

• **REMARK** Where it grows in the wild with the strawberry tree (*A. unedo*, see p.143), the two species can cross to produce the hybrid *A.* x *andrachnoides* (see p.142).

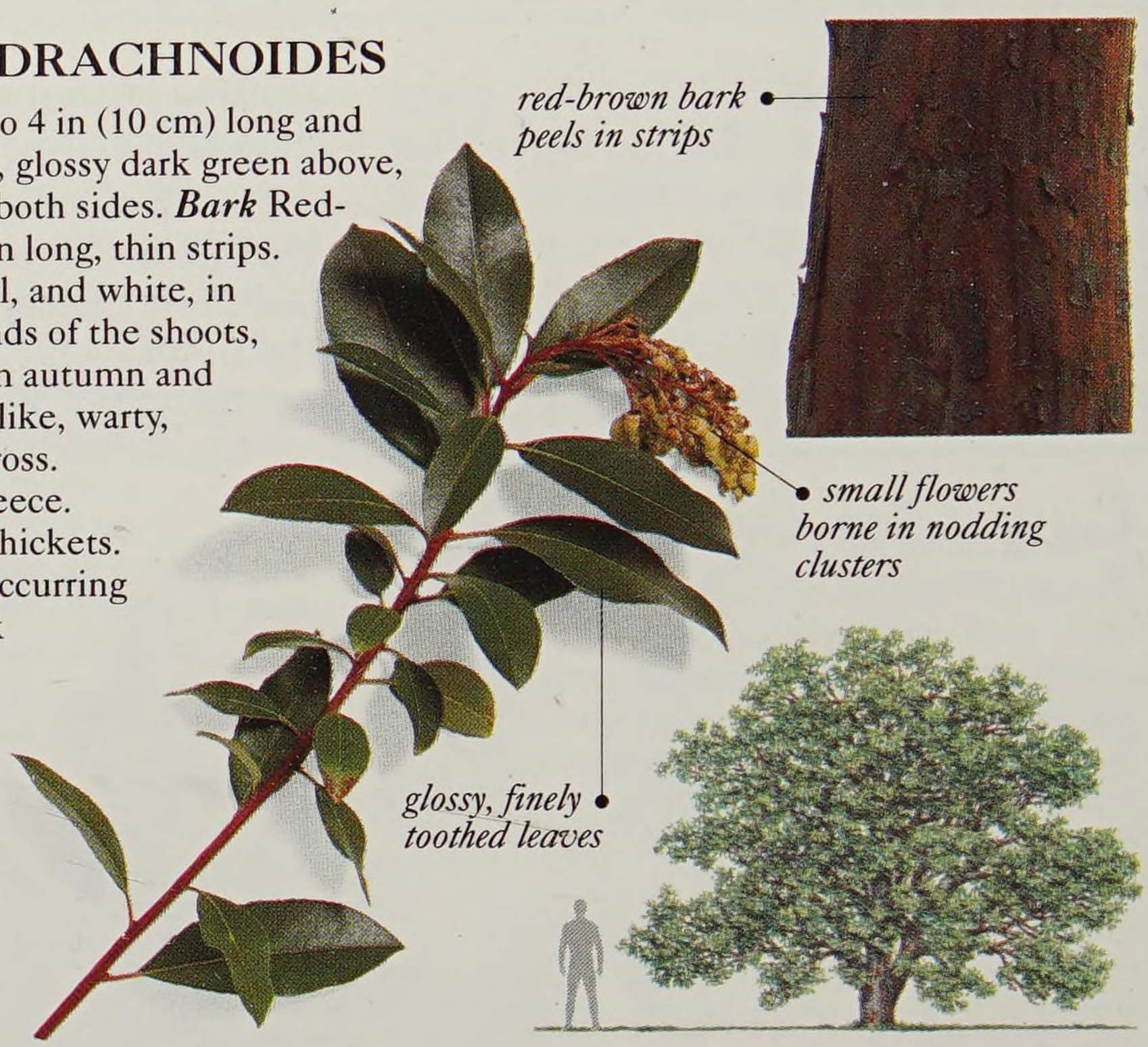
Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

Family ERICACEAE	Species *Arbutus x andrachnoides*	Author Link

ARBUTUS X ANDRACHNOIDES

Leaves Ovate to elliptic, to 4 in (10 cm) long and 2 in (5 cm) across, toothed, glossy dark green above, paler beneath, smooth on both sides. ***Bark*** Red-brown, peeling vertically in long, thin strips. ***Flowers*** Urn-shaped, small, and white, in drooping clusters at the ends of the shoots, over a long period between autumn and spring. ***Fruit*** A strawberrylike, warty, red berry, ⅝ in (1.5 cm) across.

- **NATIVE REGION** Greece.
- **HABITAT** Woods and thickets.
- **REMARK** A naturally occurring hybrid between the Greek strawberry tree *(Arbutus andrachne*, see p.141), whose rather beautiful, peeling bark it inherits, and the strawberry tree *(Arbutus unedo*, see p.143), found in the wild where the two parent plants grow together.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

Family ERICACEAE	Species *Arbutus menziesii*	Author Pursh

MADROÑA

Leaves Elliptic, to 6 in (15 cm) long and 3 in (7.5 cm) across, usually untoothed, glossy dark green above, blue-white beneath, smooth. ***Bark*** Red-brown, smooth, peeling, becoming dark and fissured with age; green when freshly exposed. ***Flowers*** Urn-shaped, small, and white, or sometimes pink-tinged, borne upright, in large, upright clusters to 6 in (15 cm) long, at the ends of the shoots in late spring. ***Fruit*** A strawberrylike, rough, orange to red berry, ⅜ in (1 cm) across, covered in small warts.

- **NATIVE REGION** W. North America.
- **HABITAT** Moist, wooded slopes, canyons in forests of oak and redwood, and coastal rocks and cliffs.
- **REMARK** Also known as Pacific madrone. The fruits are edible in small quantities. During the fruiting season, trees attract many different bird species, which serve to distribute the seeds.

Height 130 ft (40 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family ERICACEAE	Species *Arbutus unedo*	Author Linnaeus

STRAWBERRY TREE

Leaves Elliptic to oblong or obovate, to 4 in (10 cm) long and 2 in (5 cm) across, toothed, very glossy dark green above, paler beneath, smooth on both sides. ***Bark*** Red-brown, rough and fissured, not peeling. ***Flowers*** Urn-shaped, small, and white, or sometimes pink, borne in drooping clusters about 2 in (5 cm) long, at the ends of the shoots in autumn. ***Fruit*** A strawberrylike, roughly warty red berry, ¾ in (2 cm) across, ripening in autumn from flowers borne the previous year.

• **NATIVE REGION** S.W. Ireland, Mediterranean.

• **HABITAT** Rocky places and thickets.

• **REMARK** This species is one of the few members of the family that grows on lime soil. With flowers and fruits borne at the same time, it is a particularly ornamental tree.

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

Family ERICACEAE	Species *Oxydendrum arboreum*	Author (Linnaeus) Candolle

SOURWOOD (SORREL) TREE

Leaves Elliptic to oblong, to 8 in (20 cm) long and 3 in (7.5 cm) across, taper-pointed, very finely toothed, glossy dark green and smooth above, slightly hairy beneath, turning red to yellow or purple in autumn. ***Bark*** Gray-brown, thick, deeply furrowed, with scaly ridges. ***Flowers*** Urn-shaped, small, white, and numerous, fragrant, borne in large, upright clusters at the ends of the shoots in autumn. ***Fruit*** A small, woody, brown capsule.

• **NATIVE REGION** E. North America.

• **HABITAT** Woods and along streams.

• **REMARK** The species can be either a tree or a shrub. The leaves have a sharp, acid taste, somewhat similar to that of the herbaceous plant sorrel, which gives the species one of its common names.

Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family ERICACEAE	Species *Rhododendron arboreum*	Author W.W. Smith

RHODODENDRON ARBOREUM

Leaves Oblong to lanceolate, to 8 in (20 cm) long and 2 in (5 cm) across, with a pointed tip, glossy dark green and smooth with impressed midrib and veins above, variably hairy from silvery to rusty and often shining beneath. ***Bark*** Red-brown, rough and shredding. ***Flowers*** Bell-shaped, to 2 in (5 cm) long, red, pink, or sometimes white, borne in dense clusters of up to 20 in late winter to mid-spring. ***Fruit*** A woody, brown capsule, to ¾ in (2 cm), splitting open to release numerous tiny seeds.

• **NATIVE REGION** The Himalayas, with forms extending to S.W. China and Sri Lanka.

• **HABITAT** Forests and thickets in hills and mountains.

• **REMARK** In its native region and habitat, this species is a tree; in less favorable situations it may be only a large shrub. It was the first rhododendron to be introduced to Europe from the Himalayas. The young leaves are poisonous.

parallel veins run either side of prominent midrib

flowers vary in color from white through pink to deep red

thinly hairy, shining leaf underside

deep red anthers tipped with creamy pollen

flower petals marked with darker spots on inner surface

thick, leathery leaves have smooth, glossy upper surface

up to 20 flowers clustered together in each rounded head

Height 50 ft (15 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

EUCOMMIACEAE

THE ONLY MEMBER of this family, *Eucommia ulmoides* is a vigorous and decorative plant when mature. It is thought to be related most closely to the elms *(Ulmus*, see pp.308–309). If in doubt about its identity, the rubbery latex, which forms an integral part of the leaf structure, provides instant identification. However, the latex is present in quantities that are too small to make commercial extraction an economic proposition. This unique species is the only tree from temperate regions known to produce rubber.

Family EUCOMMIACEAE	Species *Eucommia ulmoides*	Author Oliver

EUCOMMIA ULMOIDES

Leaves Ovate to elliptic, to 8 in (20 cm) long and 3½ in (9 cm) across, leathery, taper-pointed at the tip, toothed, glossy dark green, with prominent lateral veining, drooping on thin shoots. ***Bark*** Pale dove-gray, deeply fissured. ***Flowers*** Males and females very small, without petals, opening on the old shoots, on separate plants in late spring just before or as the young leaves emerge. ***Fruit*** Winged, green keys, 1½ in (4 cm) long, in clusters, each key containing a seed.

• **NATIVE REGION** Not known; probably S.W. China.

• **HABITAT** Not established.

• **REMARK** This hardy tree was introduced to the West in about 1896, from plants propagated in China, and is now known only in cultivation. In China, the bark is used for medicinal purposes.

leaves just emerging at flowering time

male flowers may each have up to ten stamens

INVISIBLE RUBBER ▷ When a leaf is gently torn apart and held upside-down by its stalk, the two separate parts remain hanging together, connected almost invisibly by a network of gossamer-like latex fibers.

thin strands of rubber join two halves of a torn leaf

deeply impressed leaf veins

Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

EUCRYPHIACEAE

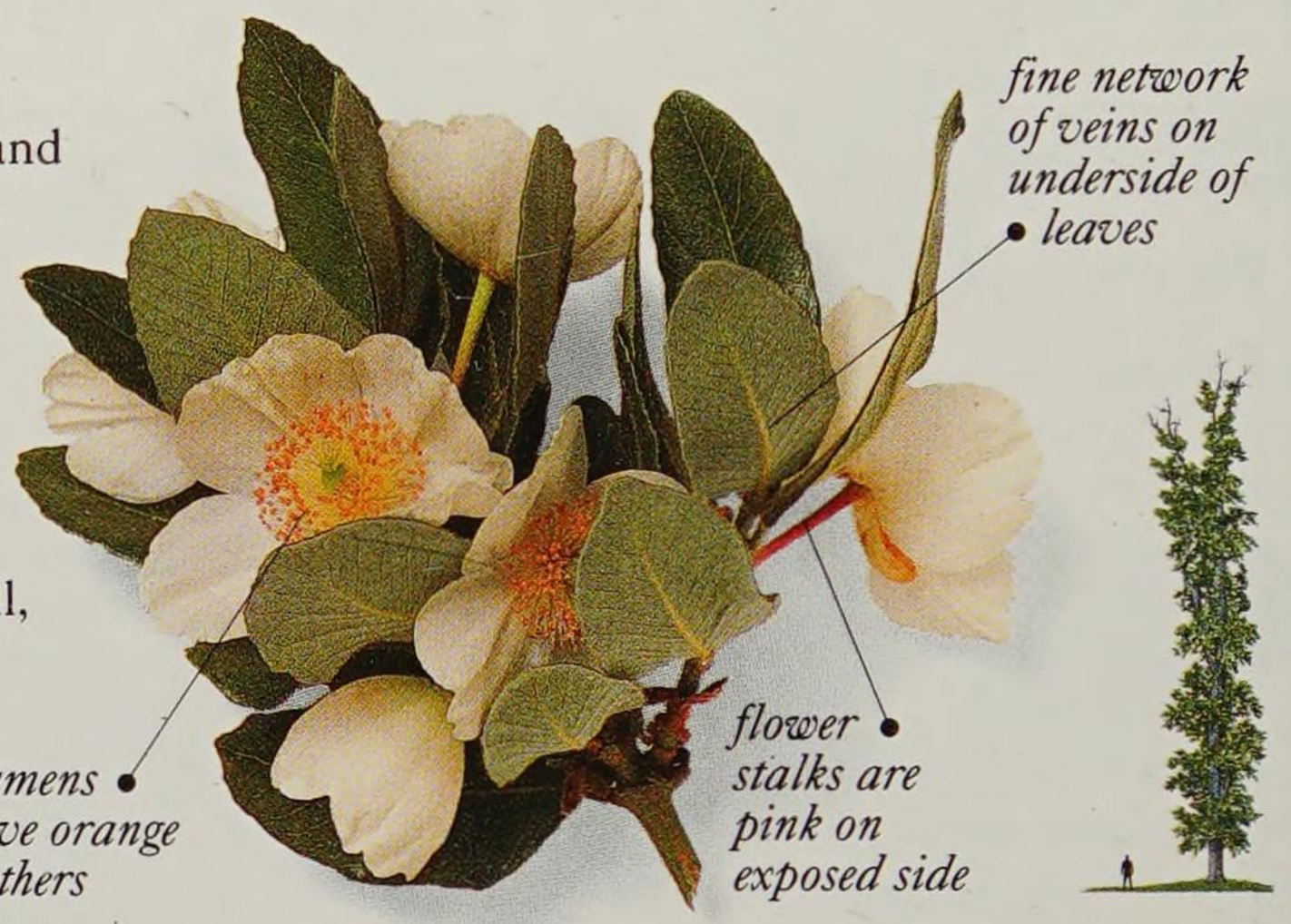
A FAMILY OF A SINGLE GENUS, with five species of evergreen trees or shrubs native to Chile and southeast Australia, including Tasmania. The leaves are opposite, and either simple or pinnate, toothed or untoothed. The white flowers usually have four petals and numerous stamens.

Family EUCRYPHIACEAE	Species *Eucryphia cordifolia*	Author Cavanilles

ULMO

Leaves Oblong, to 3 in (7.5 cm) long and 2 in (5 cm) across, heart-shaped at the base, toothed at the margin, dark green above, gray and hairy beneath. ***Bark*** Gray and smooth. ***Flowers*** 2 in (5 cm) across, white, with four petals, the numerous stamens turning from pink to orange, fragrant, singly in the leaf axils in late summer. ***Fruit*** A small, woody capsule.

- **NATIVE REGION** Chile.
- **HABITAT** Rain forests.
- **REMARK** At high altitudes, this species is a large shrub.



Height 130 ft (40 m)	Shape Narrowly columnar	Leaf persistence Evergreen	Leaf type

Family EUCRYPHIACEAE	Species *Eucryphia glutinosa*	Author (Poeppig & Endlicher) Baillon

EUCRYPHIA GLUTINOSA

Leaves Pinnate, with three to five leaflets, to 2½ in (6 cm) long and 1¼ in (3 cm) across, toothed, glossy dark green above, paler beneath, hairy at least when young on both sides. ***Bark*** Gray and smooth. ***Flowers*** 2 in (5 cm) across, white, with four petals and numerous pink-tipped stamens, fragrant, borne singly in the leaf axils in late summer. ***Fruit*** A small, woody capsule.

- **NATIVE REGION** Chile.
- **HABITAT** Forests and riverbanks.
- **REMARK** Cultivated plants of the species are semi-evergreen or deciduous, with most leaves turning orange-red in autumn before falling.

'PLENA' ▷
This selected form has double flowers.

▽ EUCRYPHIA GLUTINOSA

Height 33 ft (10 m)	Shape Narrowly columnar	Leaf persistence Evergreen	Leaf type

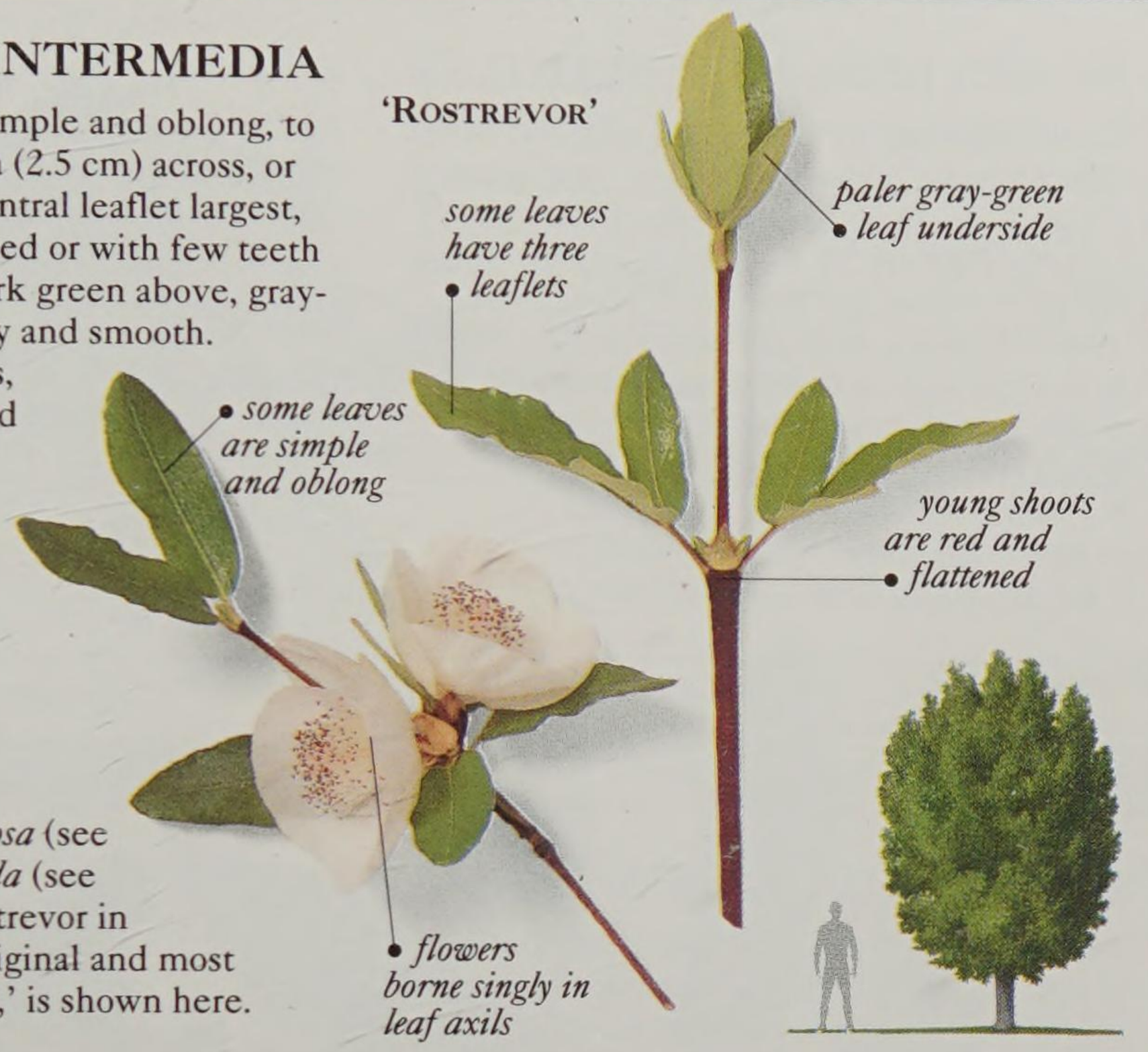
Family EUCRYPHIACEAE	Species *Eucryphia* x *intermedia*	Author Bausch

EUCRYPHIA X INTERMEDIA

Leaves Variable, either simple and oblong, to 2½ in (6 cm) long and 1 in (2.5 cm) across, or with three leaflets, the central leaflet largest, both types either untoothed or with few teeth towards the tip, glossy dark green above, gray-green beneath. ***Bark*** Gray and smooth. ***Flowers*** 2 in (5 cm) across, white, with four petals and numerous dark-tipped stamens, fragrant, borne singly in the leaf axils in late summer to autumn. ***Fruit*** A small, woody capsule.

• **NATIVE REGION** Of garden origin.

• **REMARK** A hybrid between *Eucryphia glutinosa* (see p.146) and *Eucryphia lucida* (see below), first raised at Rostrevor in Northern Ireland. The original and most common form, 'Rostrevor,' is shown here.



Height 33 ft (10 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family EUCRYPHIACEAE	Species *Eucryphia lucida*	Author (Labillardière) Baillon

EUCRYPHIA LUCIDA

Leaves Narrowly oblong, to 2 in (5 cm) long and ⅝ in (1.5 cm) across, on short stalks, untoothed, leathery, rounded to minutely notched at the tip, glossy dark green and thinly hairy above, blue-white and smooth beneath with a distinct network of veins; on vigorous shoots sometimes with three leaflets. ***Bark*** Gray, smooth. ***Flowers*** To 2 in (5 cm) across, white, with four rounded petals and numerous slender, dark-tipped stamens, fragrant, borne singly in the leaf axils in late summer, cup-shaped at first, opening flat. ***Fruit*** A small, woody capsule, splitting open when ripe.

• **NATIVE REGION** Tasmania.

• **HABITAT** Woods and riverbanks in mountainous areas.

• **REMARK** In its native region, also known as leatherwood. Cultivated plants are smaller, usually reaching only about 50 ft (15 m). A pink-flowered form found in Tasmania has been named 'Pink Cloud.'

Height 65 ft (20 m)	Shape Narrowly columnar	Leaf persistence Evergreen	Leaf type

Family EUCRYPHIACEAE	Species *Eucryphia milliganii*	Author J.D. Hooker

EUCRYPHIA MILLIGANII

Leaves Oblong, to ¾ in (2 cm) long and 5/16 in (8 mm) across, untoothed, glossy dark green above, blue-white beneath. ***Bark*** Gray and smooth. ***Flowers*** To ¾ in (2 cm) across, white, with four petals and numerous pink-tipped stamens, fragrant, borne singly in the leaf axils in late summer. ***Fruit*** A small, woody capsule.

• **NATIVE REGION** Tasmania.

• **HABITAT** Woods and riverbanks in mountainous areas.

• **REMARK** Can be a tree or a shrub.

Height 20 ft (6 m)	Shape Narrowly columnar	Leaf persistence Evergreen	Leaf type

Family EUCRYPHIACEAE	Species *Eucryphia* x *nymansensis*	Author Bausch

EUCRYPHIA X NYMANSENSIS

Leaves Elliptic, to 2½ in (6 cm) long and 1¼ in (3 cm) across, or with three leaflets, toothed, glossy dark green above, paler beneath. ***Bark*** Gray and smooth. ***Flowers*** To 3 in (7.5 cm) across, white, with four petals and numerous pink-tipped stamens, in the leaf axils in late summer to autumn. ***Fruit*** A small, woody capsule.

• **NATIVE REGION** Of garden origin.

• **REMARK** A hybrid between ulmo *(Eucryphia cordifolia*, see p.146) and *Eucryphia glutinosa* (see p.146).

Height 50 ft (15 m)	Shape Narrowly columnar	Leaf persistence Evergreen	Leaf type

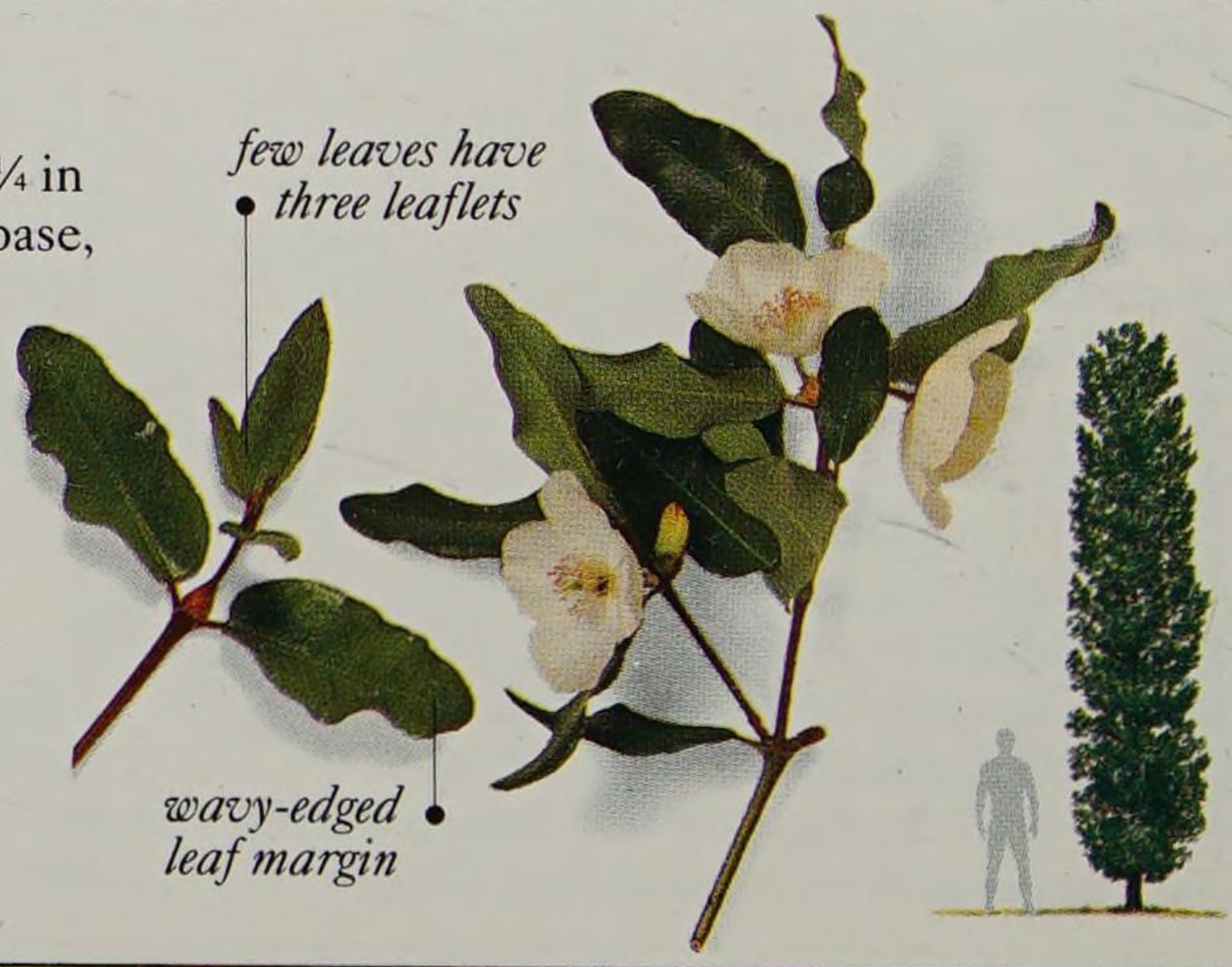
Family EUCRYPHIACEAE	Species *Eucryphia* 'Penwith'	Author None

EUCRYPHIA 'PENWITH'

Leaves Oblong, to 2¾ in (7 cm) long and 1¼ in (3 cm) across, slightly heart-shaped at the base, untoothed, dark green and smooth above, blue-white and nearly smooth beneath. ***Bark*** Dark gray and smooth. ***Flowers*** To 2 in (5 cm) across, white, with four petals and numerous pink-tipped stamens, fragrant, in the leaf axils in late summer to autumn. ***Fruit*** A small, woody capsule.

• **NATIVE REGION** Of garden origin.

• **REMARK** A hybrid between ulmo *(Eucryphia cordifolia*, see p.146) and *Eucryphia lucida* (see p.147).



Height 50 ft (15 m)	Shape Narrowly columnar	Leaf persistence Evergreen	Leaf type

FAGACEAE

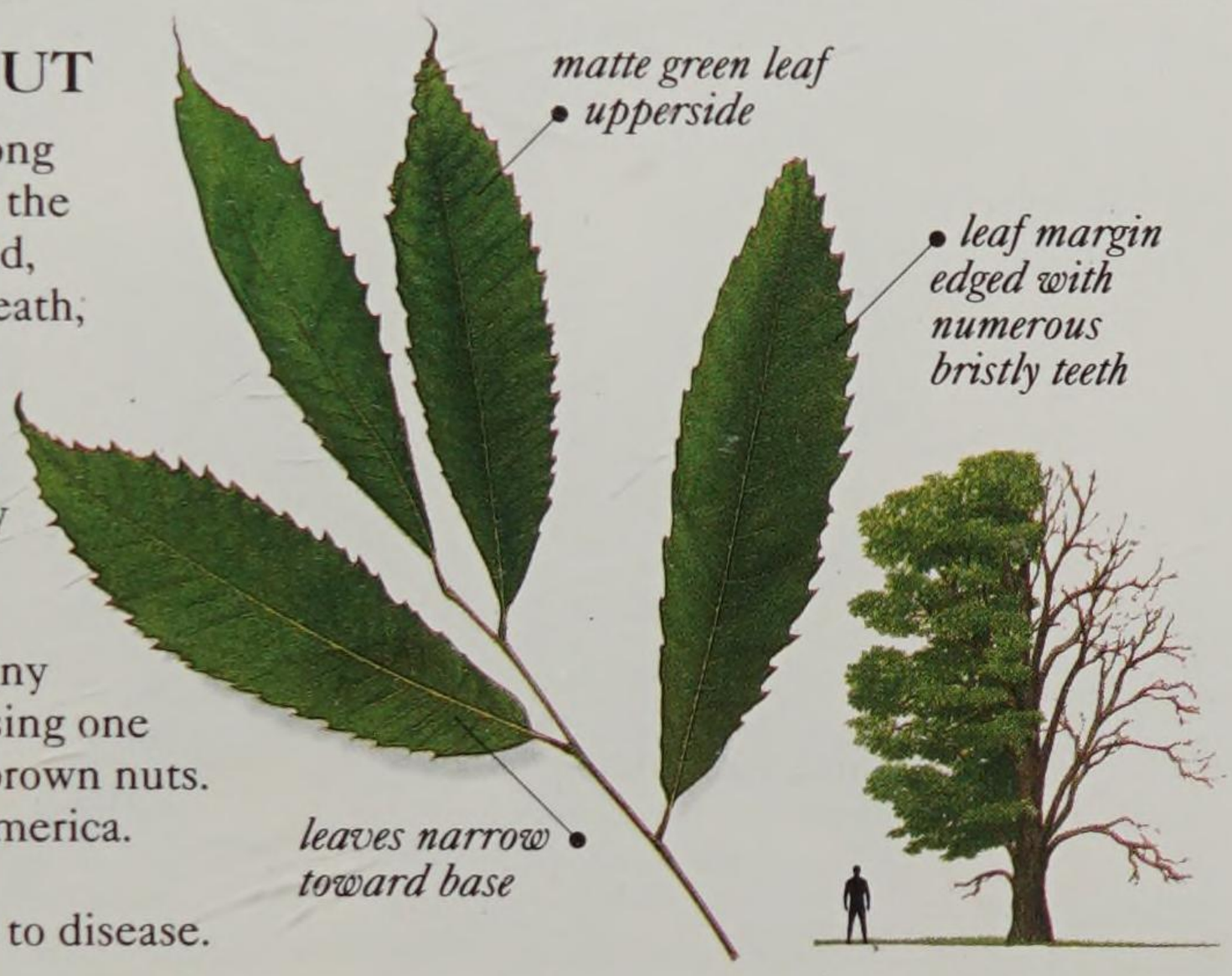
SOME VERY FAMILIAR deciduous and evergreen trees belong to this family, which includes the chestnuts *(Castanea*, see pp.149–150), beeches *(Fagus*, see pp.151–153), and oaks *(Quercus*, see pp.158–173). Eight genera with over 1,000 species extend from northern temperate regions to parts of the southern hemisphere. The leaves are simple, lobed, or toothed. The small male or female flowers are often in separate catkins, on the same plant. The fruit is a nut, surrounded by or enclosed in a cupule.

Family FAGACEAE	Species *Castanea dentata*	Author (Marshall) Borkhausen

AMERICAN CHESTNUT

Leaves Oblong, to 10 in (25 cm) long and 2 in (5 cm) across, narrowed at the base, taper-pointed, sharply toothed, matte dark green above, paler beneath, smooth on both sides. ***Bark*** Dark brown, shallowly fissured, with broad, scaly ridges. ***Flowers*** Males and females both small and creamy yellow, in catkins to 8 in (20 cm) long, separate but usually on the same spike in summer. ***Fruit*** A spiny husk, to 2½ in (6 cm) across, enclosing one to three edible, sweet, glossy red-brown nuts.

- **NATIVE REGION** E. North America.
- **HABITAT** Woods.
- **REMARK** Increasingly rare due to disease.



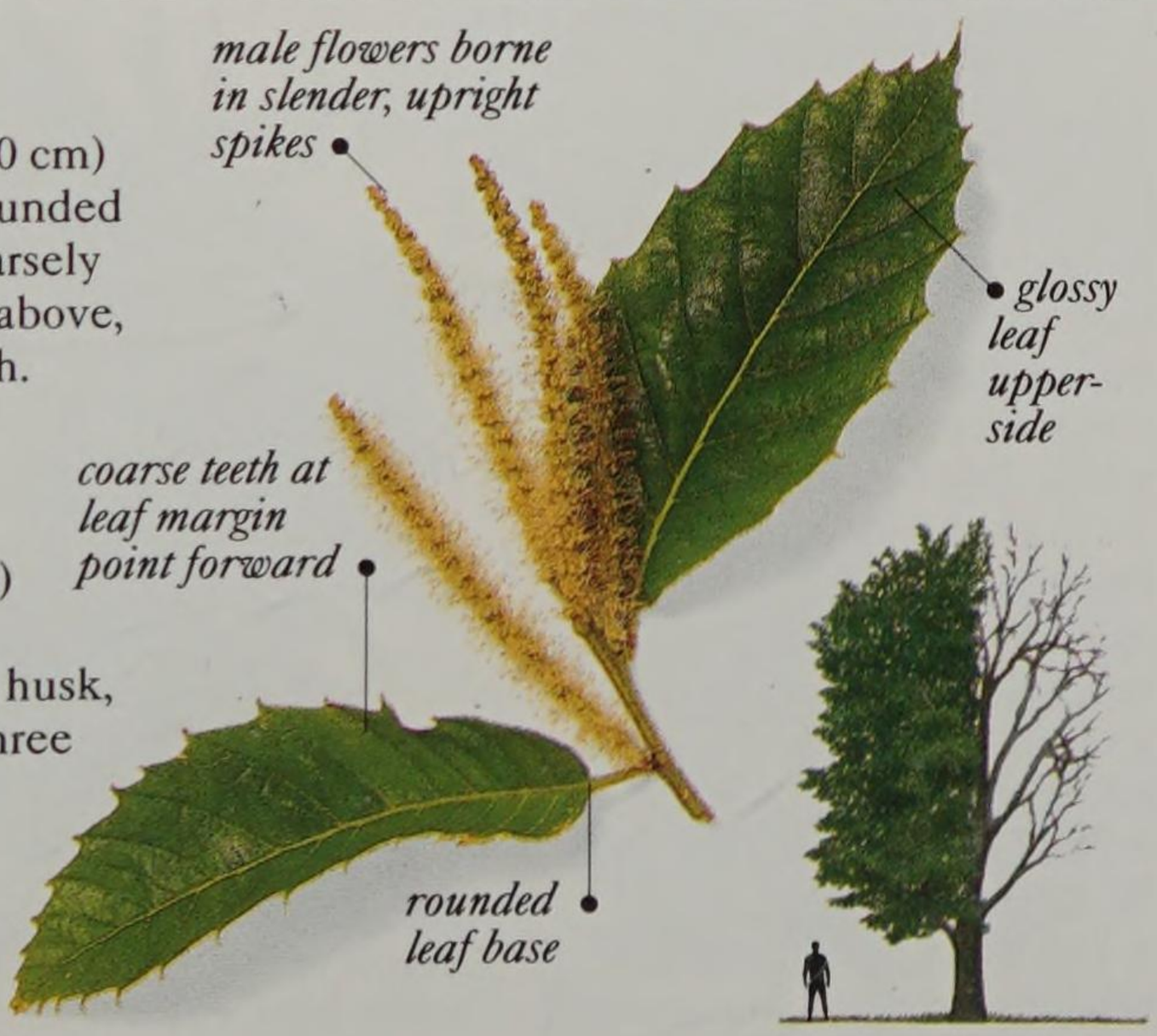
Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Castanea mollissima*	Author Blume

CHINESE CHESTNUT

Leaves Oblong to lanceolate, to 8 in (20 cm) long and 3 in (7.5 cm) across, usually rounded at the base, taper-pointed at the tip, coarsely toothed, glossy dark green and smooth above, softly hairy at least when young beneath. ***Bark*** Dark gray, smooth, becoming gray-brown and fissured with age. ***Flowers*** Males and females small and creamy yellow, in catkins to 8 in (20 cm) long, separate but usually on the same spike in summer. ***Fruit*** A spiny, downy husk, to 2 in (5 cm) across, enclosing two to three edible, glossy red-brown nuts.

- **NATIVE REGION** China.
- **HABITAT** Mountain woods.
- **REMARK** This species is grown in China for its nuts.



Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Castanea sativa*	Author Miller

SWEET CHESTNUT

Leaves Oblong, to 8 in (20 cm) long and 3 in (7.5 cm) across, usually rounded or heart-shaped at the base, taper-pointed at the tip, toothed, glossy dark green and smooth above, paler becoming smooth beneath. ***Bark*** Gray and smooth, becoming brown and usually spirally ridged with age. ***Flowers*** Males and females both small and creamy yellow, in catkins to 10 in (25 cm) long, separate but usually on the same spike in summer. ***Fruit*** A spiny husk, to 2½ in (6 cm) across, enclosing one to three edible, glossy red-brown nuts.

• **NATIVE REGION** N. Africa, S.W. Asia, S. Europe.

• **HABITAT** Woods.

Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

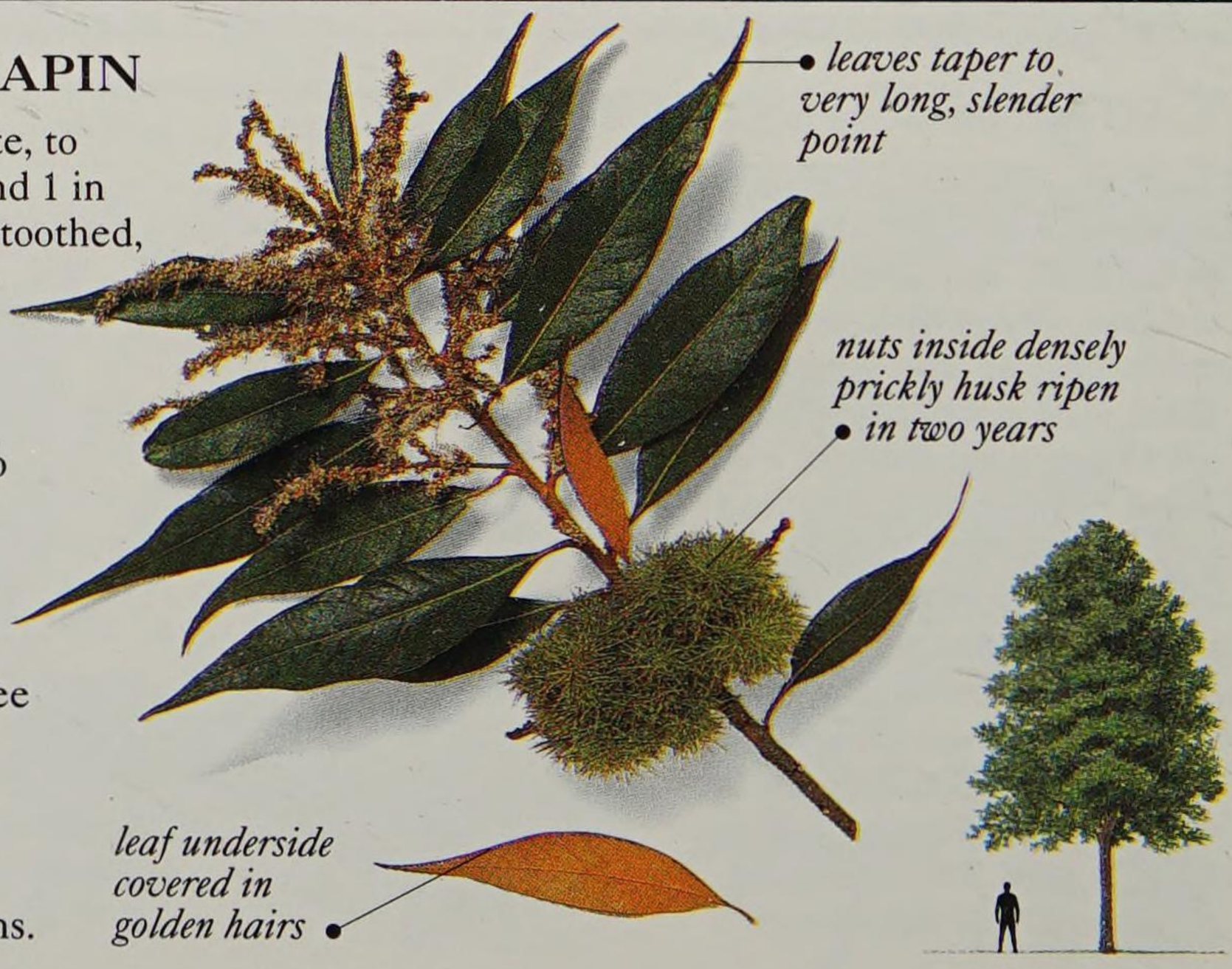
Family FAGACEAE	Species *Chrysolepis chrysophylla*	Author (W.J. Hooker) Hjelmqvist

GOLDEN CHINKAPIN

Leaves Oblong to lanceolate, to 4 in (10 cm) or more long and 1 in (2.5 cm) across, leathery, untoothed, glossy dark green above, hairy beneath. ***Bark*** Gray, furrowed. ***Flowers*** Males and females both creamy white, fragrant, in catkins to 1½ in (4 cm) long, separate but usually on the same spike in summer. ***Fruit*** A spiny husk, to 1½ in (4 cm) across, enclosing one to three edible, glossy brown nuts.

• **NATIVE REGION** W. United States.

• **HABITAT** Woods and thickets in coastal mountains.



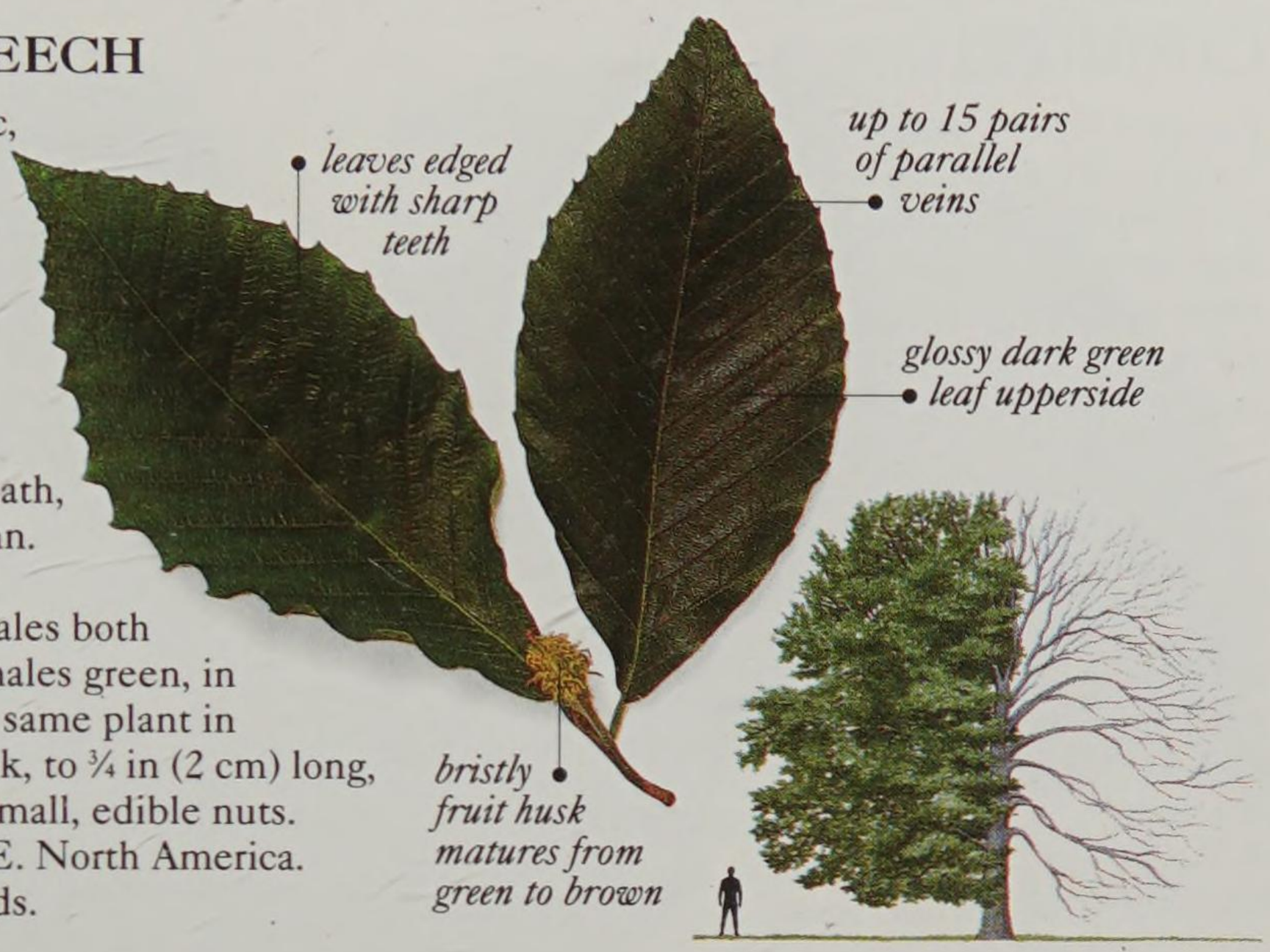
Height 100 ft (30 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family FAGACEAE	Species *Fagus grandifolia*	Author Ehrhart

AMERICAN BEECH

Leaves Ovate to elliptic, to 4¾ in (12 cm) long and 2½ in (6 cm) across, taper-pointed, toothed, with 11 to 15 pairs of veins, silky-hairy becoming smooth or nearly so, glossy dark green above, paler beneath, turning yellow in autumn. ***Bark*** Gray and smooth. ***Flowers*** Males and females both small, males yellow, females green, in separate clusters on the same plant in mid-spring. ***Fruit*** A husk, to ¾ in (2 cm) long, enclosing one to three small, edible nuts.

- **NATIVE REGION** E. North America.
- **HABITAT** Rich woods.



Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Fagus orientalis*	Author Lipsky

ORIENTAL BEECH

Leaves Elliptic to obovate, to 4¾ in (12 cm) long and 2½ in (6 cm) across, usually with a wavy margin, untoothed or slightly toothed, with up to 12 pairs of veins, dark green and smooth above, silky-hairy on the veins beneath, turning yellow in autumn. ***Bark*** Gray, smooth, sometimes furrowed. ***Flowers*** Males and females small, males yellow, females green, borne in separate clusters on the same plant in mid-spring. ***Fruit*** A bristly husk, to 1 in (2.5 cm) long, enclosing one to three small, edible nuts.

- **NATIVE REGION** S.W. Asia, S.E. Europe.
- **HABITAT** Hills and mountains.

Height 100 ft (30 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Fagus sylvatica*	Author Linnaeus

COMMON BEECH

Leaves Ovate to obovate, to 4 in (10 cm) long and 2½ in (6 cm) across, abruptly short-pointed, with a wavy margin, untoothed or edged with small teeth, with fewer than ten pairs of veins, silky-hairy when unfolding becoming smooth, glossy dark green above, paler beneath, turning yellow in autumn. ***Bark*** Gray, smooth. ***Flowers*** Small, males yellow, females green, borne in separate clusters on the same plant in mid-spring as the young, pale green leaves emerge. ***Fruit*** A bristly husk, to 1 in (2.5 cm) long, enclosing one to three small, edible nuts.

• **NATIVE REGION** Europe.

• **HABITAT** Woods, particularly on chalk.

fruit husk covered in dense bristles

◁ △ **FAGUS SYLVATICA**

wavy, untoothed or slightly toothed leaf margin

no more than ten pairs of parallel veins

Δ 'AUREA PENDULA'
This slender tree has hanging branches, clothed from spring to autumn with foliage that matures from golden yellow to green.

∇ 'ASPLENIIFOLIA'
The slender leaves of the fern-leaved beech are deeply cut into long, narrow lobes.

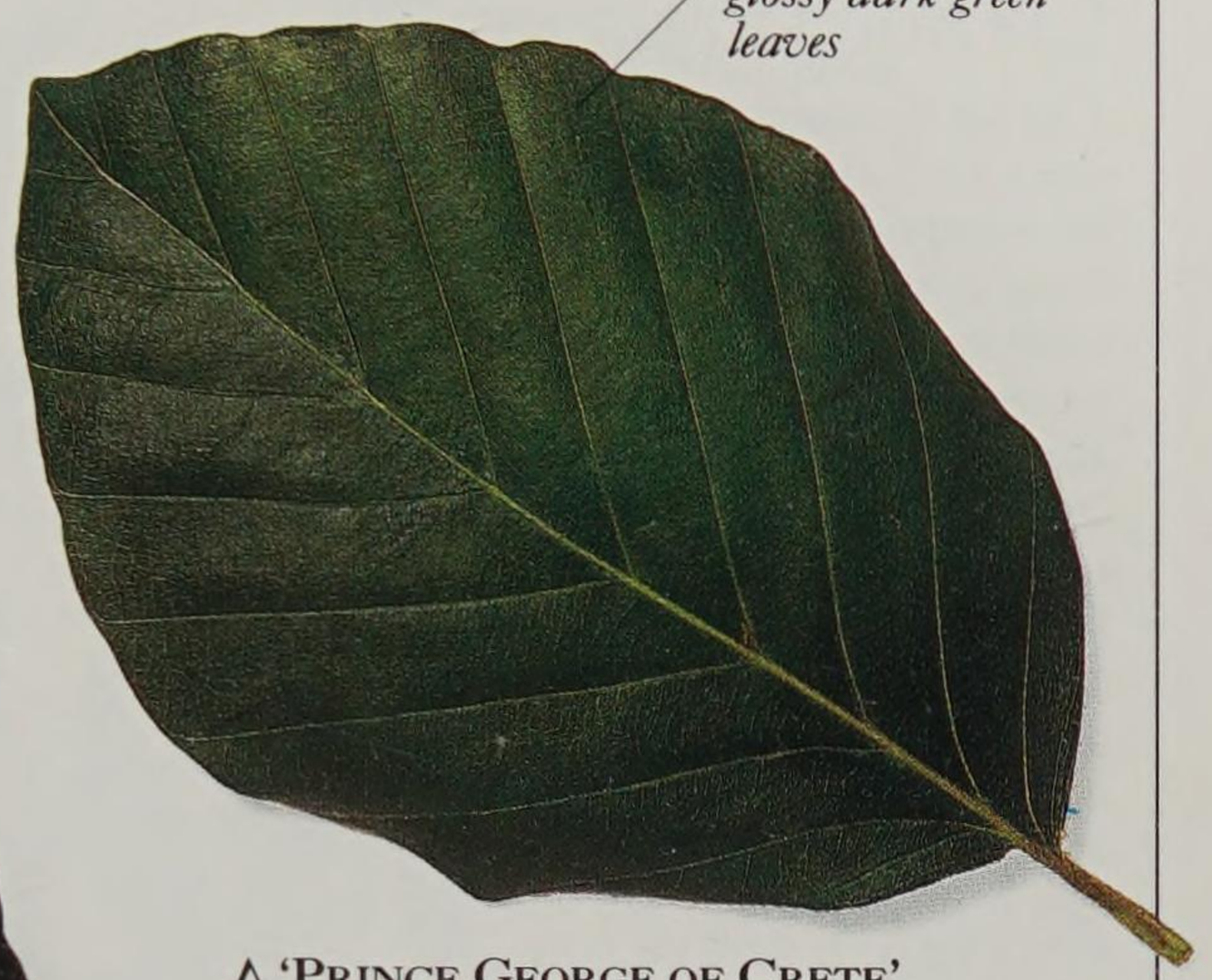
leaves taper to long, fine point

curiously contorted leaves

'CRISTATA' ▷
Clustered and seemingly misshapen leaves are a feature of this very unusual form.

Height 130 ft (40 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

▽ 'DAWYCK PURPLE'
The copper beeches are charaterized by their deep red-purple foliage. 'Dawyck Purple', one such form, grows into a narrowly columnar tree. It is a seedling of 'Dawyck', which is similar, but has green foliage.



△ 'PRINCE GEORGE OF CRETE'
This form is selected for its particularly large, broad leaves. Other forms with large leaves also occur. This group is known as *Fagus sylvatica* f. *latifolia*.

▷ 'ROTUNDIFOLIA'
The cultivar name of this distinct form describes the small, rounded leaves that characterize this tree. They are carried on strongly upswept branches.

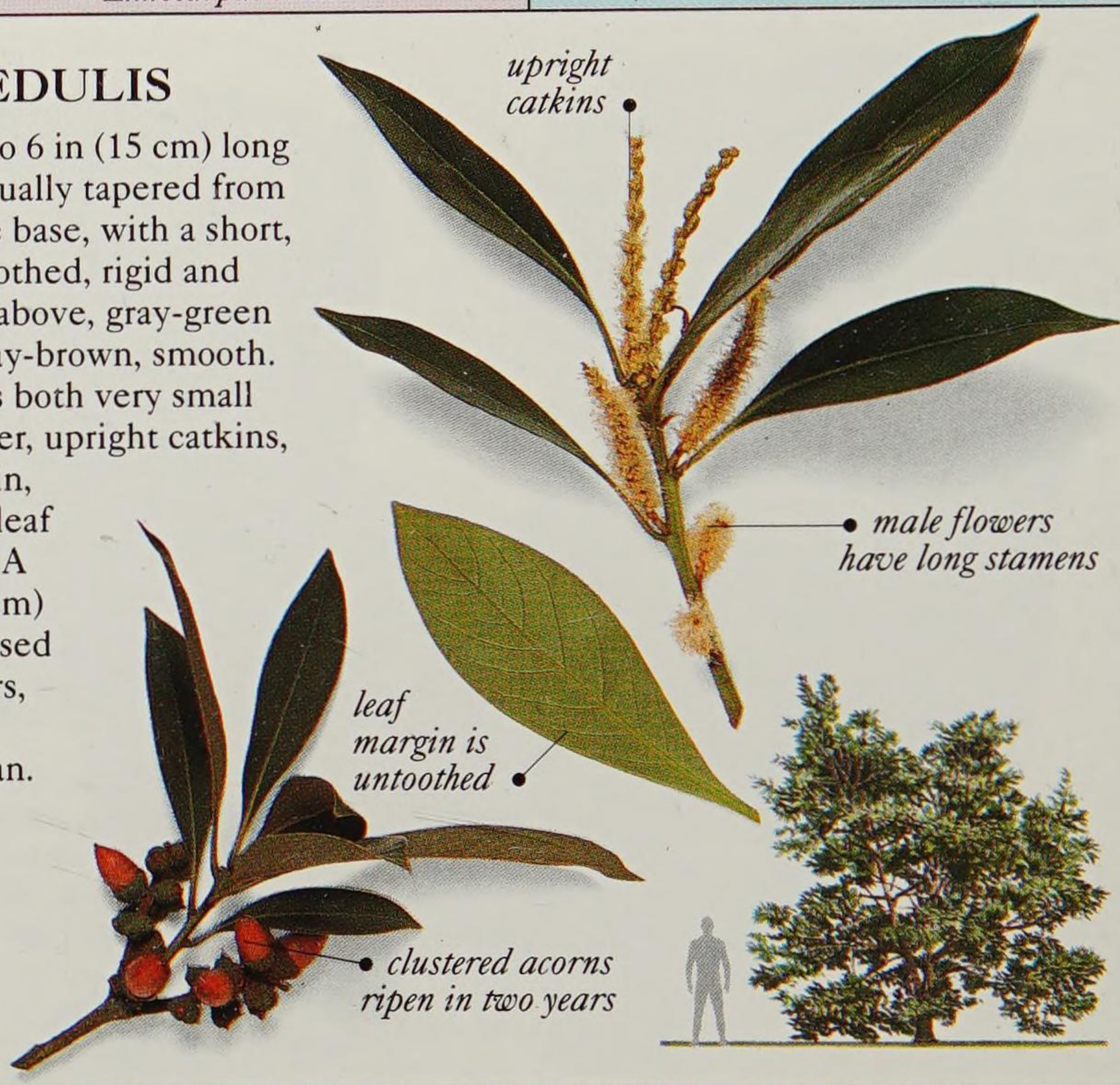
◁ 'ROHANII'
This cultivar resembles the fern-leaved beech *(Fagus sylvatica* 'Aspleniifolia,' see p.152). Its has somewhat broader leaves colored greenish purple.

Family FAGACEAE	Species *Lithocarpus edulis*	Author (Makino) Nakai

LITHOCARPUS EDULIS

Leaves Narrowly elliptic, to 6 in (15 cm) long and 2 in (5 cm) across, gradually tapered from the center of the leaf to the base, with a short, blunt point at the tip, untoothed, rigid and leathery, glossy pale green above, gray-green beneath, smooth. ***Bark*** Gray-brown, smooth. ***Flowers*** Males and females both very small and creamy white, in slender, upright catkins, males at the tip of the catkin, females at the base, in the leaf axils in late summer. ***Fruit*** A pointed acorn, to 1 in (2.5 cm) long, about one-third enclosed in a cup, in stalkless clusters, ripe in two years.

- **NATIVE REGION** Japan.
- **HABITAT** Woods.
- **REMARK** *Lithocarpus* species are closely related to the oaks *(Quercus*, see pp.158–173) but differ in their upright catkins.



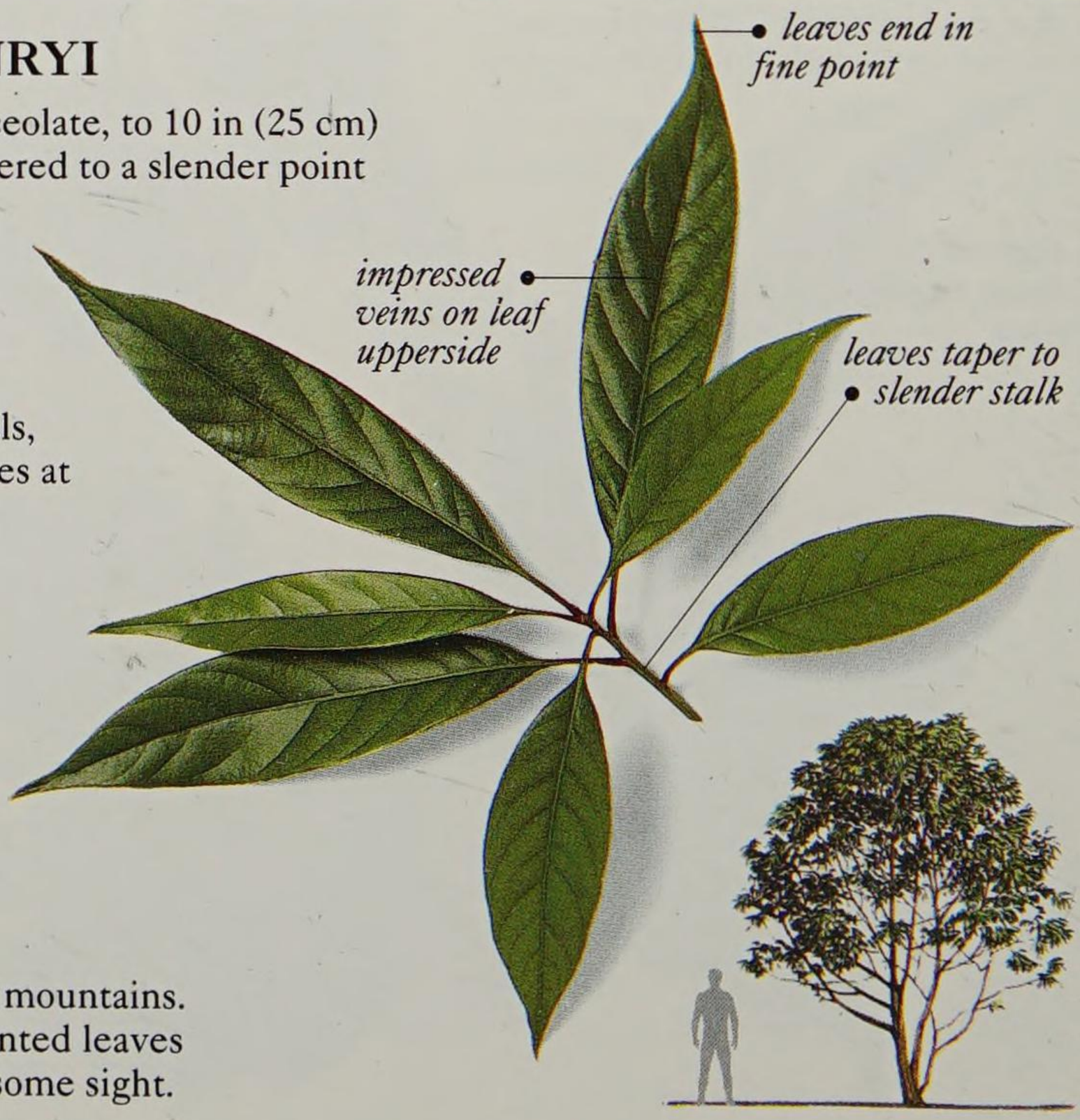
Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

Family FAGACEAE	Species *Lithocarpus henryi*	Author (Seemann) Rehder & Wilson

LITHOCARPUS HENRYI

Leaves Elliptic to oblong or lanceolate, to 10 in (25 cm) long and 3 in (7.5 cm) across, tapered to a slender point at the tip, untoothed, pale green becoming dark and slightly glossy, whitish when young beneath, thinly hairy becoming smooth on both sides. ***Bark*** Gray with pale gray lenticels, and shallow, orange-brown fissures at the base. ***Flowers*** Males and females both very small and creamy white, in slender, upright catkins, separately but on the same spike in late summer. ***Fruit*** A rounded acorn, about ¾ in (2 cm) long, enclosed in a shallow cup, borne in dense clusters.

- **NATIVE REGION** China.
- **HABITAT** Woods in hills and mountains.
- **REMARK** The bold, long-pointed leaves make the massed foliage a handsome sight.



Height 50 ft (15 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family FAGACEAE	Species *Nothofagus antarctica*	Author (J.G. Forster) Oersted

ANTARCTIC BEECH

Leaves Ovate, to 1¼ in (3 cm) long and ¾ in (2 cm) across, finely toothed, with usually four pairs of veins, glossy dark green above, more or less smooth on both sides. ***Bark*** Dark gray, cracking into plates and flaking with age. ***Flowers*** Males and females both very small, males with red anthers, in clusters of one to three, females with red stigmas, in clusters of two to three, in the leaf axils in late spring. ***Fruit*** A smooth husk, to ¼ in (6 mm) long, enclosing three small nuts.

• **NATIVE REGION** S. Argentina. S. Chile.

• **HABITAT** Deciduous woods and scrub in mountains.

• **REMARK** Also known as nirre. In its native region and habitat, the spccies is usually a medium-sized tree, but it can also form a large shrub.

Height 50 ft (15 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Nothofagus betuloides*	Author (Mirbel) Blume

NOTHOFAGUS BETULOIDES

Leaves Ovate to elliptic, to 1 in (2.5 cm) long and ¾ in (2 cm) across, broadly tapered to the often unequal base, bluntly toothed, glossy dark blackish green above, paler and glossy with a fine network of veins beneath, smooth on both sides; older leaves often with small, dark spots beneath. ***Bark*** Very dark gray, cracking into plates and flaking with age. ***Flowers*** Males and females both very small, males with red anthers, singly, females with red stigmas, in clusters of three, in the leaf axils in late spring. ***Fruit*** A bristly husk, to ¼ in (6 mm) long, enclosing three small nuts.

• **NATIVE REGION** Argentina, Chile.

• **HABITAT** Evergreen forests.

• **REMARK** Sometimes shrubby.

Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family FAGACEAE	Species *Nothofagus dombeyi*	Author (Mirbel) Blume

NOTHOFAGUS DOMBEYI

Leaves Narrowly ovate, to 1½ in (4 cm) long and ⅝ in (1.5 cm) across, rounded at the often unequal base, finely and sharply toothed, glossy dark green above, paler and glossy with a fine network of veins beneath, smooth, with small, black spots. ***Bark*** Dark gray, cracking into plates and flaking with age. ***Flowers*** Males and females both very small, males with red anthers, in clusters of three, females with red stigmas, in clusters of three, in the leaf axils in late spring. ***Fruit*** A bristly husk, to ¼ in (6 mm) long, enclosing three small nuts.

• **NATIVE REGION**
Argentina, Chile.

• **HABITAT**
Mountain forests.

• **REMARK** This species is similar to *Nothofagus betuloides* (see p.155) but differs in its larger leaves and taller growing habit.

Height 130 ft (40 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family FAGACEAE	Species *Nothofagus nervosa*	Author (Poeppig & Endlicher) Oersted

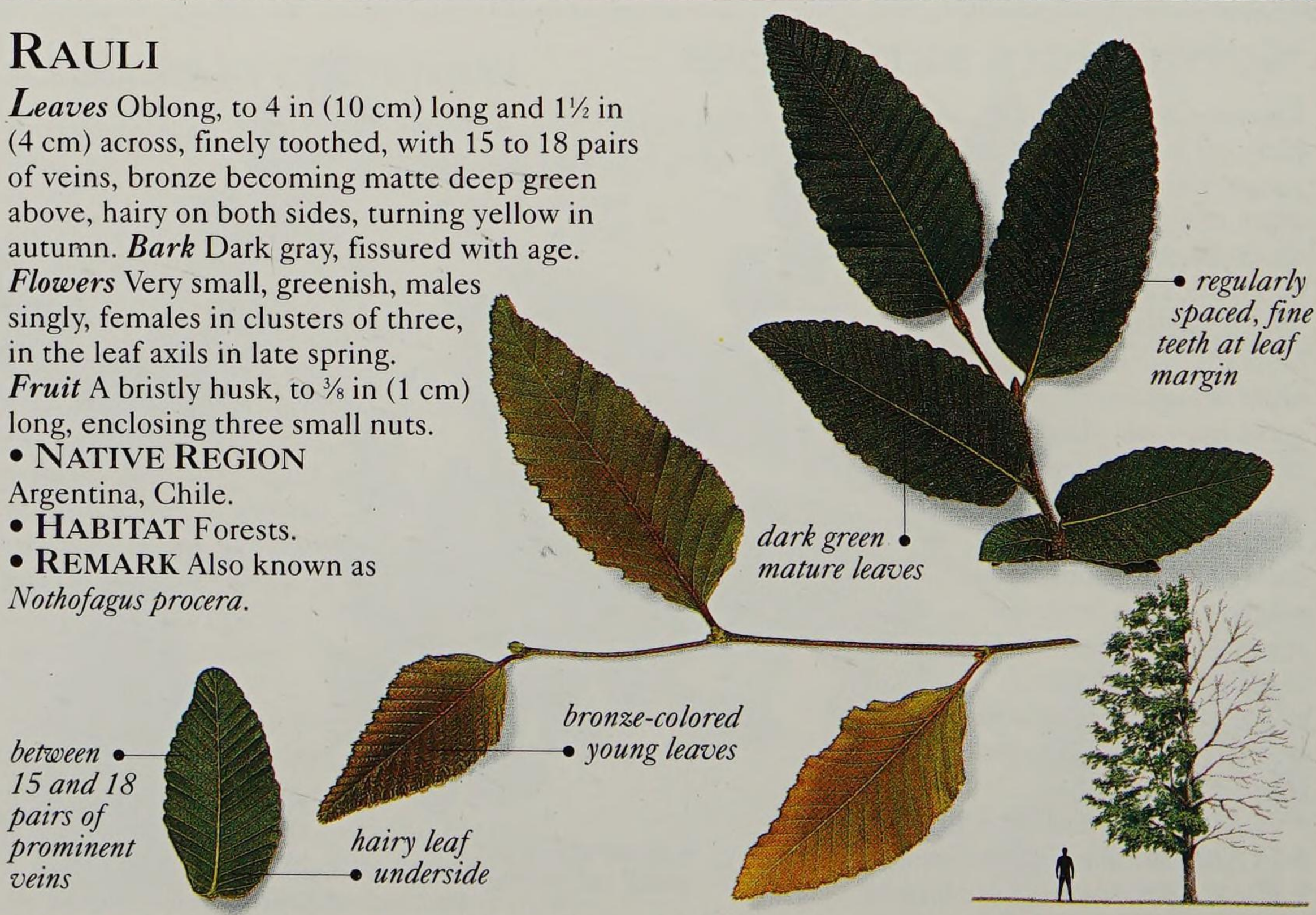
RAULI

Leaves Oblong, to 4 in (10 cm) long and 1½ in (4 cm) across, finely toothed, with 15 to 18 pairs of veins, bronze becoming matte deep green above, hairy on both sides, turning yellow in autumn. ***Bark*** Dark gray, fissured with age. ***Flowers*** Very small, greenish, males singly, females in clusters of three, in the leaf axils in late spring. ***Fruit*** A bristly husk, to ⅜ in (1 cm) long, enclosing three small nuts.

• **NATIVE REGION**
Argentina, Chile.

• **HABITAT** Forests.

• **REMARK** Also known as *Nothofagus procera*.



Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

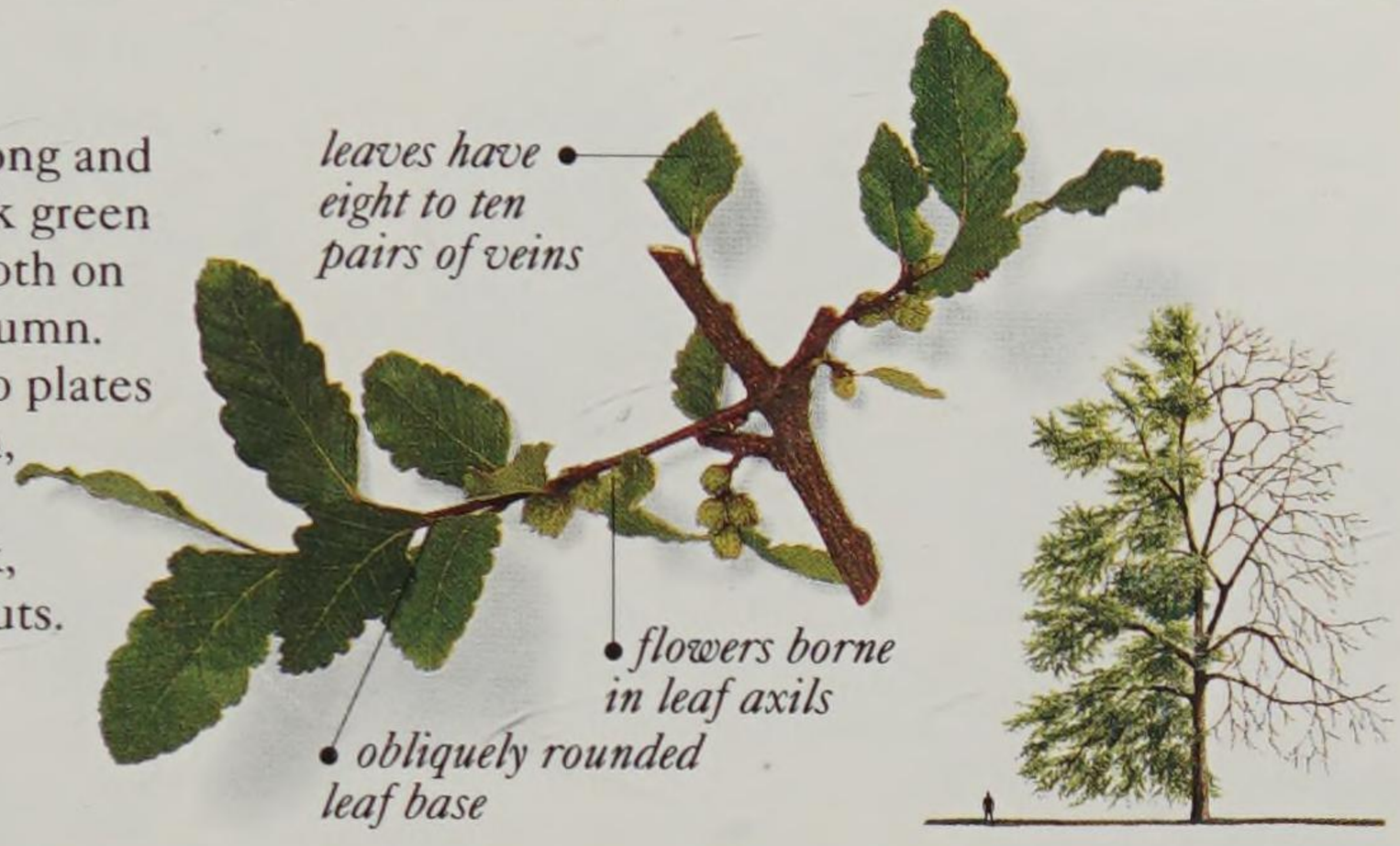
Family FAGACEAE	Species *Nothofagus obliqua*	Author (Mirbel) Blume

ROBLE BEECH

Leaves Ovate, to 3 in (7.5 cm) long and 1½ in (4 cm) across, toothed, dark green above, blue-green beneath, smooth on both sides, turning yellow in autumn. ***Bark*** Gray, smooth, cracking into plates with age. ***Flowers*** Tiny, greenish, males singly, females in threes, in late spring. ***Fruit*** A scaly husk, to ⅜ in (1 cm) long, with three nuts.

• **NATIVE REGION**
Argentina, Chile.

• **HABITAT** Forests.



Height 115 ft (35 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

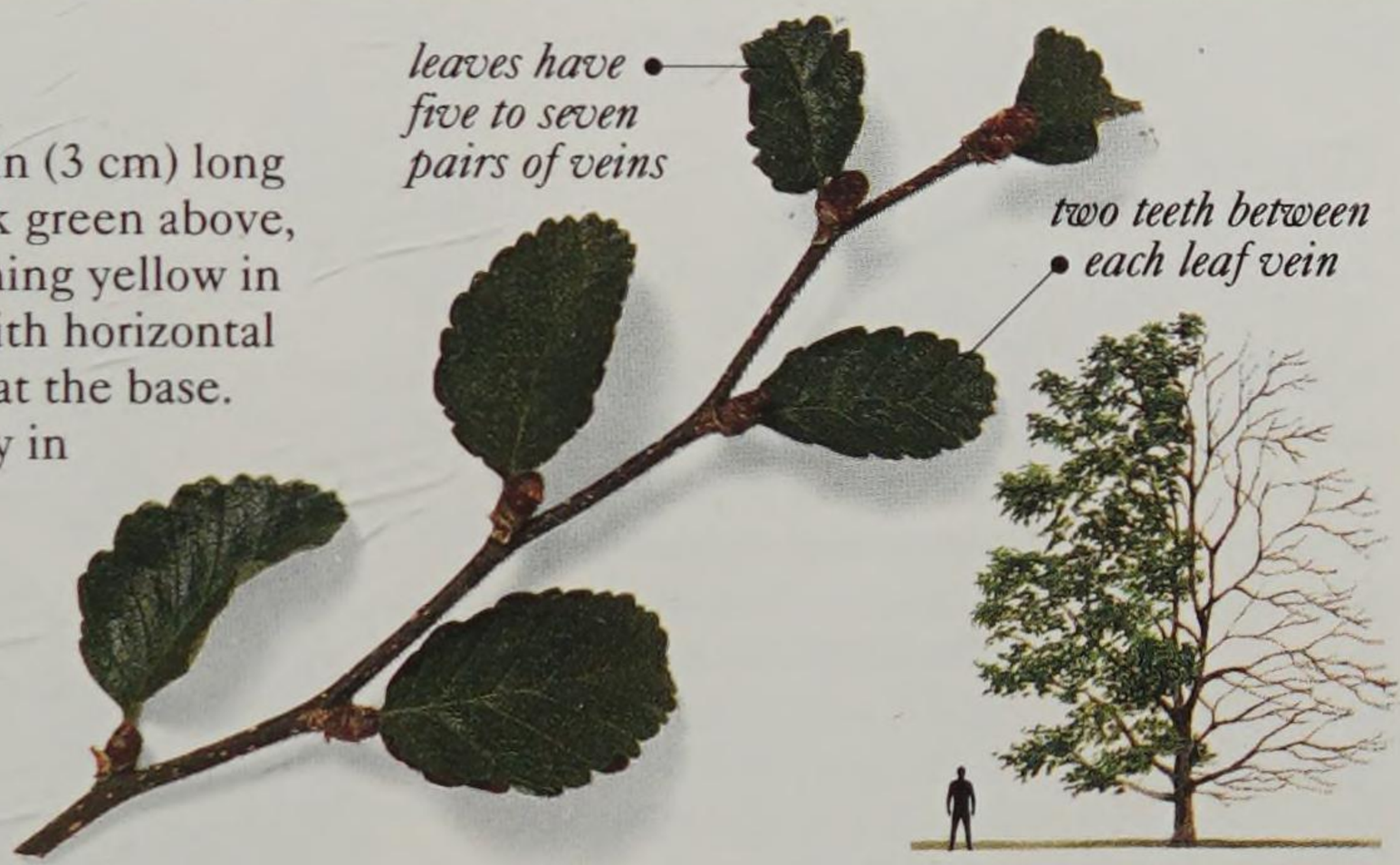
Family FAGACEAE	Species *Nothofagus pumilio*	Author (Poeppig & Endlicher) Krasser

LENGA

Leaves Elliptic to ovate, to 1¼ in (3 cm) long and ¾ in (2 cm) across, very dark green above, slightly hairy on both sides, turning yellow in autumn. ***Bark*** Purple-brown, with horizontal lenticels and wrinkles, fissured at the base. ***Flowers*** Very small, borne singly in the leaf axils in late spring. ***Fruit*** A scaly husk, to ⅜ in (1 cm) long, enclosing three small nuts.

• **NATIVE REGION**
Argentina, Chile.

• **HABITAT** Forests.



Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

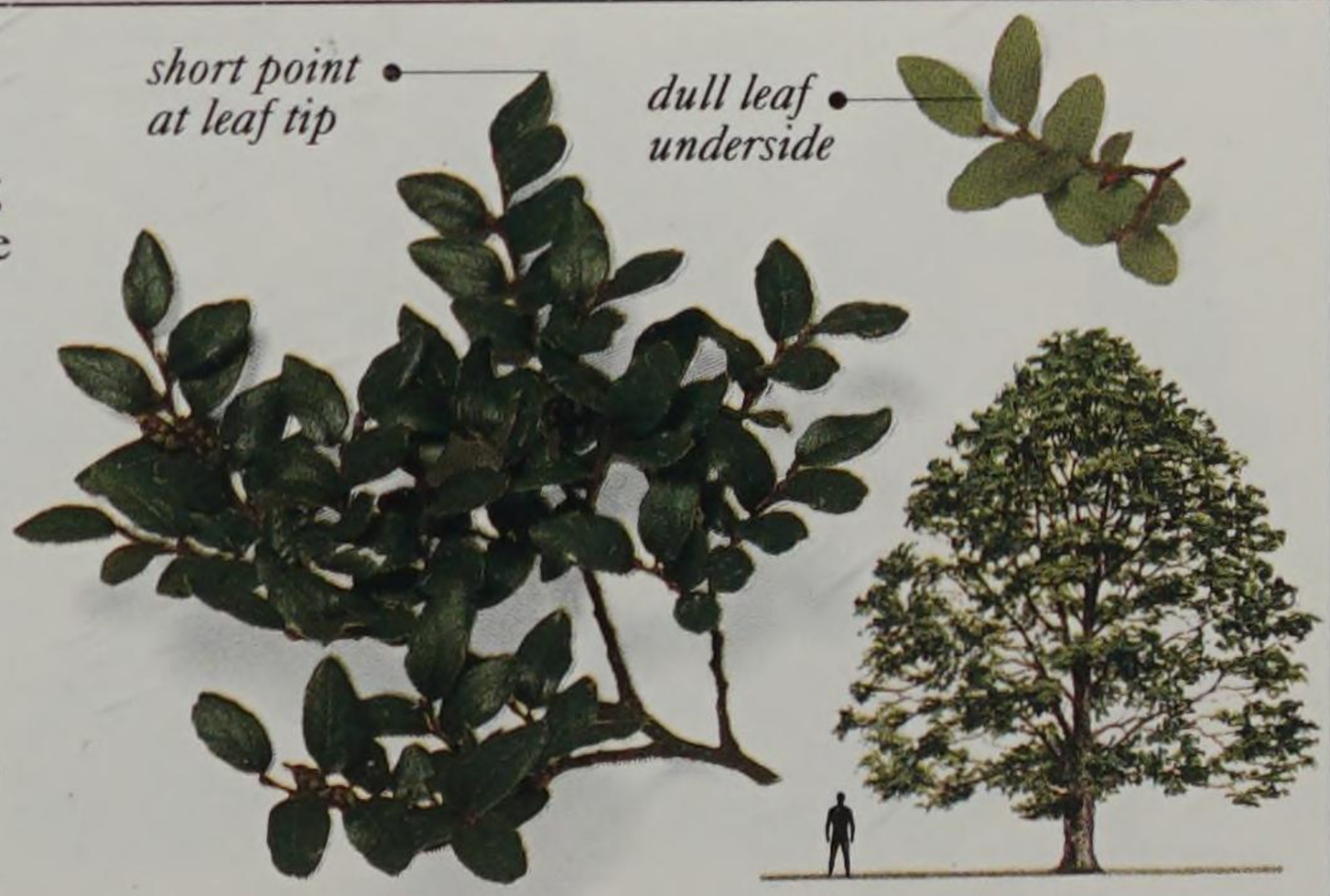
Family FAGACEAE	Species *Nothofagus solandri*	Author (J.D. Hooker) Oersted

BLACK BEECH

Leaves Elliptic, to ⅝ in (1.5 cm) long and ⅜ in (1 cm) across, rounded at the tip, untoothed, dark green above, gray-hairy beneath. ***Bark*** Dark gray, rough, furrowed. ***Flowers*** Very small, males with red anthers, singly or in pairs, females in clusters of up to three, in the leaf axils in late spring. ***Fruit*** A scaly husk, enclosing three small nuts.

• **NATIVE REGION** New Zealand.

• **HABITAT** Lowland and mountain forests.



Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family FAGACEAE	Species *Quercus acutissima*	Author Carruthers

SAWTOOTH OAK

Leaves Oblong, to 8 in (20 cm) long and 2½ in (6 cm) across, with numerous veins ending in slender-tipped teeth, glossy green above, paler beneath, smooth on both sides. ***Bark*** Gray-brown, with deep fissures. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, separately on the same plant in late spring. ***Fruit*** A rounded acorn, to 1 in (2.5 cm) long, about two-thirds enclosed in a cup.

• **NATIVE REGION** Himalayas to Japan.

• **HABITAT** Woods.

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus alba*	Author Linnaeus

WHITE OAK

Leaves Obovate, to 8 in (20 cm) long and 4 in (10 cm) across, tapered at the base, deeply cut into two to four lobes on each side, pink-tinged and white-hairy becoming bright green above, blue-green beneath, turning purple-red in autumn. ***Bark*** Pale gray and scaly, fissured with age. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, borne separately on the same plant in late spring. ***Fruit*** An acorn, to 1 in (2.5 cm) long, one-quarter enclosed in a roughened cup.

• **NATIVE REGION** E. North America.

• **HABITAT** Dry woods.

• **REMARK** The state tree of Connecticut, Illinois, and Maryland.

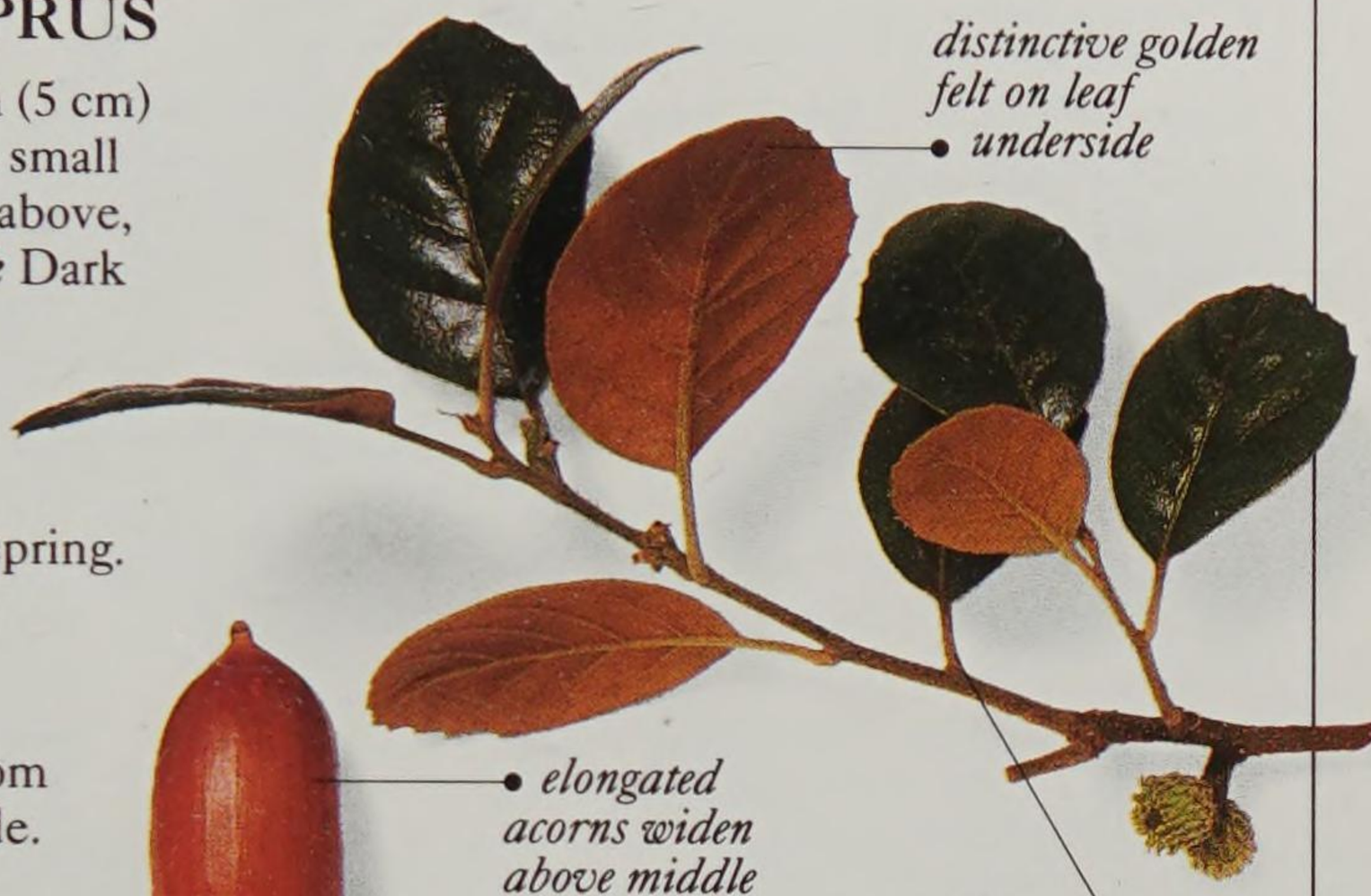
Height 115 ft (35 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus alnifolia*	Author Poech

GOLDEN OAK OF CYPRUS

Leaves Rounded and convex, to 2 in (5 cm) long and across, leathery, edged with small teeth, glossy dark green and smooth above, covered in golden felt beneath. ***Bark*** Dark gray, with pale gray to orange-brown lenticels. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, borne separately on the same plant in late spring. ***Fruit*** An acorn, to 1¼ in (3 cm) long.

- **NATIVE REGION** Cyprus.
- **HABITAT** Mountains.
- **REMARK** Easily distinguished from most oaks by the felted leaf underside.



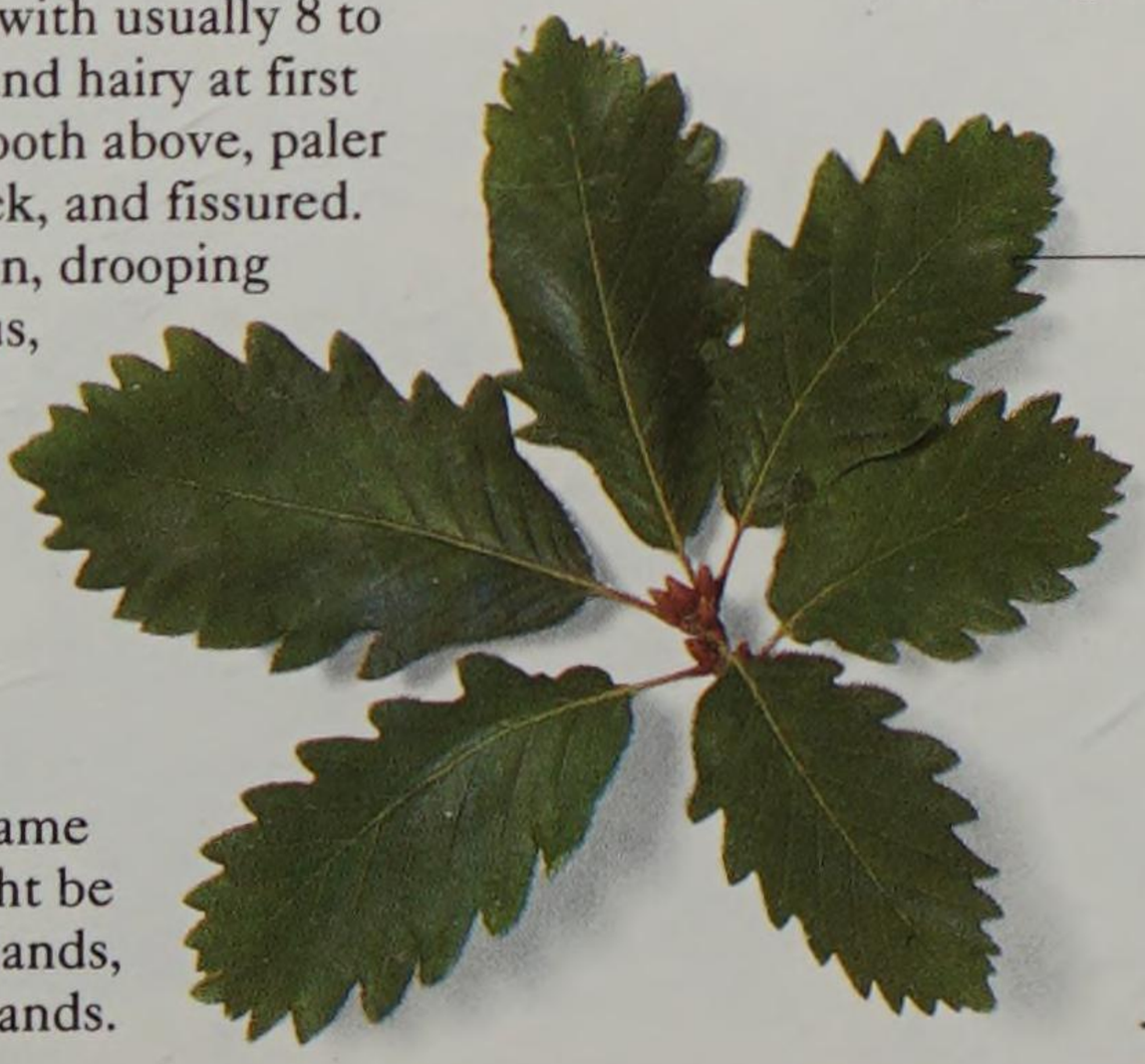
Height 26 ft (8 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

Family FAGACEAE	Species *Quercus canariensis*	Author Willdenow

ALGERIAN OAK

Leaves Obovate to elliptic, to 6 in (15 cm) long and 3 in (7.5 cm) across, with usually 8 to 12 prominent lobes, reddish and hairy at first becoming dark green and smooth above, paler beneath. ***Bark*** Dark gray, thick, and fissured. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, separately on the same plant in late spring. ***Fruit*** An acorn, to 1 in (2.5 cm) long, one-third enclosed in a cup.

- **NATIVE REGION** N. Africa, S.W. Europe.
- **HABITAT** Woods.
- **REMARK** The scientific name suggests that this species might be associated with the Canary Islands, but it is not native to these islands.



Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus castaneifolia*	Author C.A. Meyer

CHESTNUT-LEAVED OAK

Leaves Oblong, to 8 in (20 cm) long and 3 in (7.5 cm) across, with 10 to 12 teeth on each side, glossy dark green and smooth above, blue-gray and thinly hairy beneath. ***Bark*** Gray and smooth. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, borne separately on the same plant in late spring. ***Fruit*** An acorn, to 1 in (2.5 cm) long, one-half enclosed in a cup, the cup covered in long scales.

• **NATIVE REGION**
Caucasus, N. Iran.

• **HABITAT** Forests.

Height 100 ft (30 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus cerris*	Author Linnaeus

TURKEY OAK

Leaves Elliptic to oblong, to 4¾ in (12 cm) long and 3 in (7.5 cm) across, deeply lobed, toothed, glossy dark green above, downy when young becoming smooth beneath. ***Bark*** Dark gray-brown, thick, rough, and deeply ridged. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, borne separately on the same plant in early summer. ***Fruit*** An acorn, to 1 in (2.5 cm) long, one-half enclosed in a cup, the cup covered in long, slender scales.

• **NATIVE REGION**
C. and S. Europe.

• **HABITAT** Woods.

'VARIEGATA' ▷
The leaves of this form are margined yellow when they unfold, and creamy white as they mature.

Height 115 ft (35 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus coccinea*	Author Münchhausen

SCARLET OAK

Leaves Elliptic, to 6 in (15 cm) long and 4 in (10 cm) across, deeply lobed, toothed, glossy dark green and smooth above, paler and glossy with small tufts of hairs in the vein axils beneath, turning bright red in autumn. ***Bark*** Dark gray-brown, smooth, shallowly ridged with age. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, separately on the same plant in late spring. ***Fruit*** An acorn, to 1 in (2.5 cm) long, up to one-half enclosed in a glossy cup.

- NATIVE REGION E. North America.
- HABITAT Woods and sandy soil.

Δ 'SPLENDENS' This form has deep red autumn foliage.

QUERCUS COCCINEA

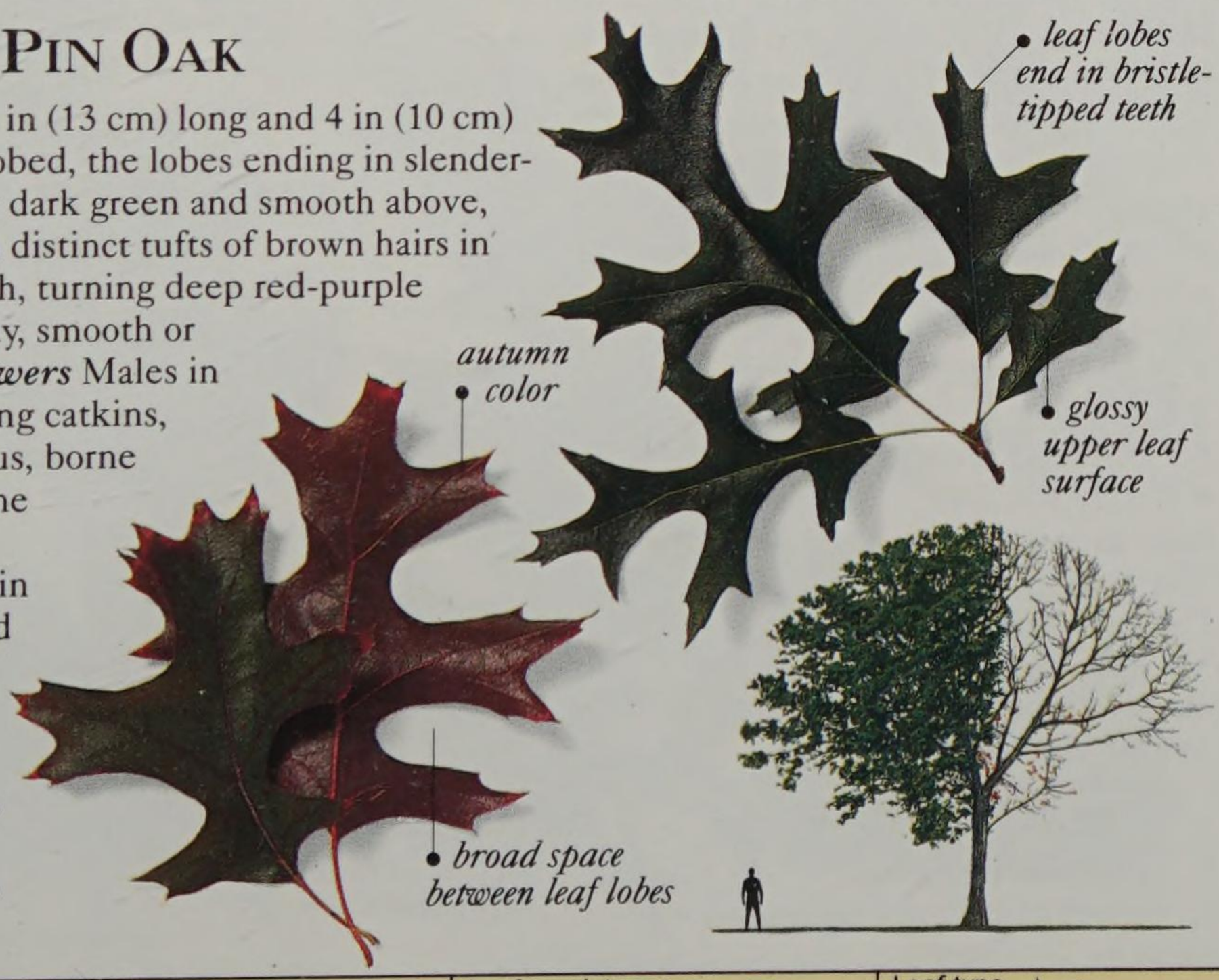
Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus ellipsoidalis*	Author Hill

NORTHERN PIN OAK

Leaves Elliptic, to 5 in (13 cm) long and 4 in (10 cm) across, very deeply lobed, the lobes ending in slender-pointed teeth, glossy dark green and smooth above, paler and glossy with distinct tufts of brown hairs in the vein axils beneath, turning deep red-purple in autumn. ***Bark*** Gray, smooth or lightly furrowed. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, borne separately on the same plant in late spring. ***Fruit*** An acorn, to ¾ in (2 cm) long, one-third to one-half enclosed in a gray cup.

- NATIVE REGION S. Canada, N. United States.
- HABITAT Woods, usually on dry soil.



Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus falcata*	Author Michaux

SPANISH OR SOUTHERN RED OAK

Leaves Elliptic to ovate, to 8 in (20 cm) long and 6 in (15 cm) across, deeply cut into bristle-tipped lobes, the terminal lobe often long and narrow, glossy dark green and smooth above, covered in brown or grayish hairs beneath. ***Bark*** Dark gray-brown, fissured into narrow ridges. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, separately on the same plant in late spring. ***Fruit*** An acorn, to ¾ in (2 cm) long, one-third to one-half enclosed in a broad, shallow cup.

• **NATIVE REGION**
S.E. United States.

• **HABITAT** Dry woods from coast to mountains.

Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus frainetto*	Author Tenore

HUNGARIAN OAK

Leaves Obovate to oblong, to 8 in (20 cm) long and 4 in (10 cm) across, with numerous lobes, deep green and hairy at least when young above, gray-green and downy beneath. ***Bark*** Dark gray, rugged and fissured. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, borne separately on the same plant in late spring. ***Fruit*** An acorn, to ¾ in (2 cm) long, one-half enclosed in a cup.

• **NATIVE REGION**
S.E. Europe.

• **HABITAT** Woods.

• **REMARK** The form shown, 'Hungarian Crown' has branches that sweep up to make a broadly oval crown.

Height 100 ft (30 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

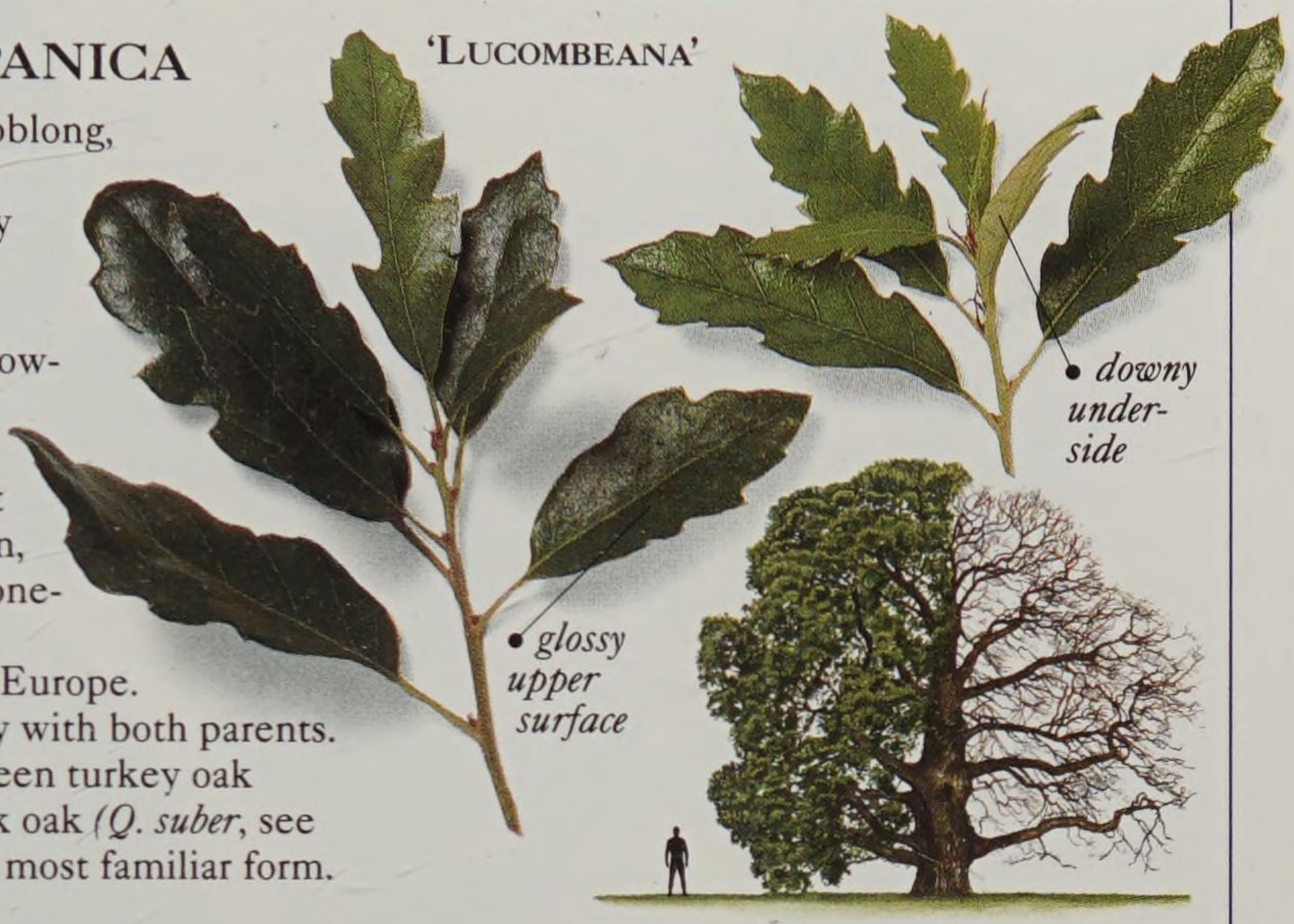
Family FAGACEAE	Species *Quercus × hispanica*	Author Lamarck

QUERCUS × HISPANICA

'LUCOMBEANA'

Leaves Ovate to elliptic or oblong, to 5 in (13 cm) long and 2 in (5 cm) across, toothed, glossy dark green above, gray and downy beneath. ***Bark*** Gray, corky. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, separately on the same plant in late spring. ***Fruit*** An acorn, to 1 in (2.5 cm) long, about one-third enclosed in a cup.

- **NATIVE REGION** S.W. Europe.
- **HABITAT** Woods, usually with both parents.
- **REMARK** A hybrid between turkey oak *(Q. cerris*, see p.160) and cork oak *(Q. suber*, see p.172). 'Lucombeana' is the most familiar form.



Height	Shape	Leaf persistence	Leaf type

Family FAGACEAE	Species *Quercus ilex*	Author Linnaeus

HOLM OAK OR HOLLY OAK

Leaves Elliptic to narrowly ovate, to 3 in (7.5 cm) long and 2 in (5 cm) across, rigid and leathery, taper-pointed, untoothed or with few small teeth, white-hairy when young becoming glossy dark green above, gray and hairy beneath. ***Bark*** Nearly black and rough, cracking into small squares. ***Flowers*** Males in yellow, drooping catkins, females inconspicuous, borne separately on the same plant in early summer. ***Fruit*** An acorn, to ¾ in (2 cm) long, one-third enclosed in a cup.

- **NATIVE REGION** Mediterranean.
- **HABITAT** Hills, woods, scrub, and dry places.

Height 100 ft (30 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

Family FAGACEAE	Species *Quercus imbricaria*	Author A. Michaux

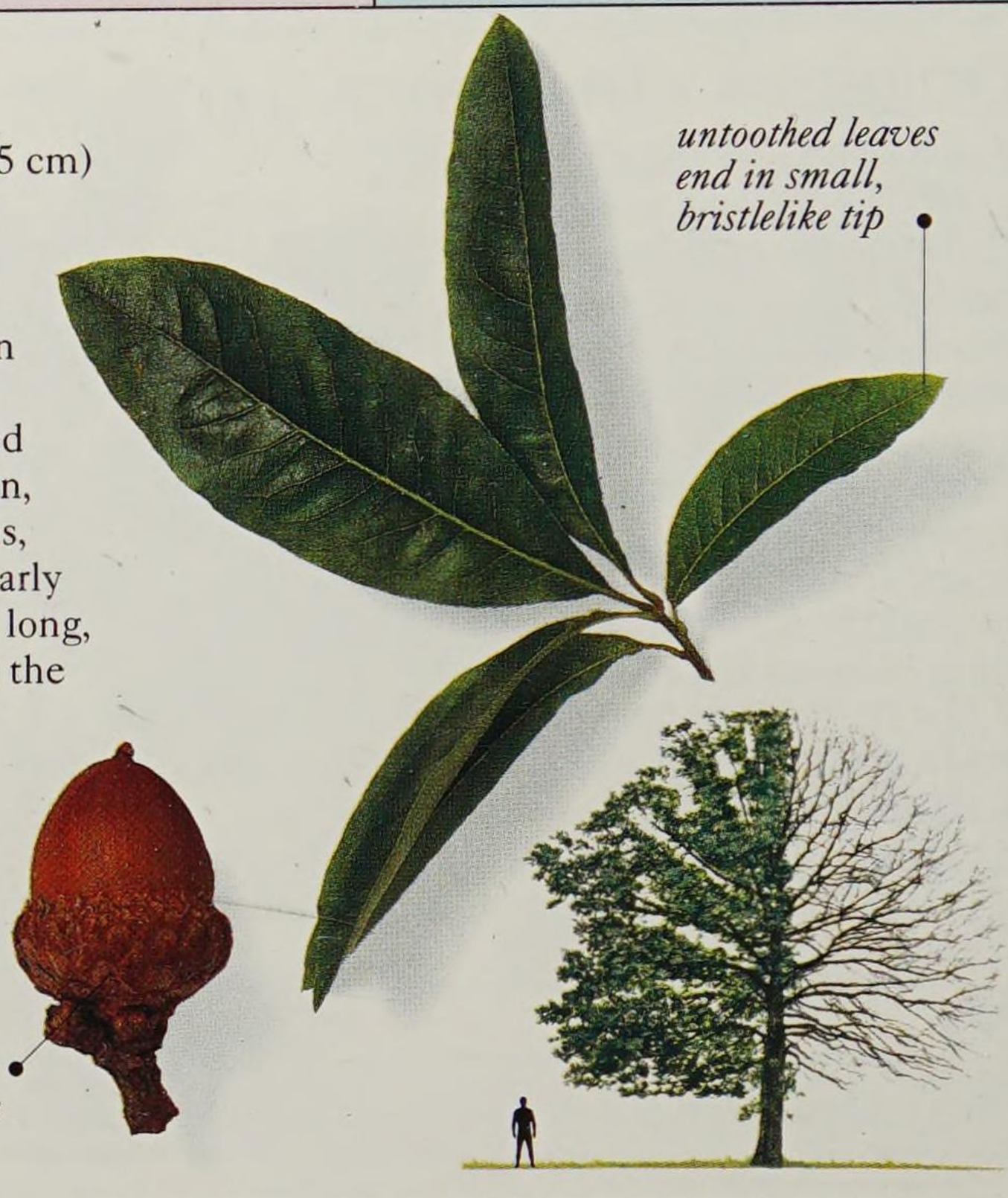
SHINGLE OAK

Leaves Oblong to lanceolate, to 6 in (15 cm) long and 3 in (7.5 cm) across, ending in a fine point, untoothed, yellow when young becoming glossy dark green and smooth above, gray-hairy beneath, often persisting far into winter. ***Bark*** Gray-brown, smooth at first becoming fissured with age. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, borne separately on the same plant in early summer. ***Fruit*** An acorn, to ¾ in (2 cm) long, one-third to one-half enclosed in a cup, the cup covered in broad, hairy scales.

• **NATIVE REGION** C. and E. United States.

• **HABITAT** Rich woods and riverbanks.

• **REMARK** Early settlers made roof shingles from the wood, giving this species its common name.



Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus laurifolia*	Author A. Michaux

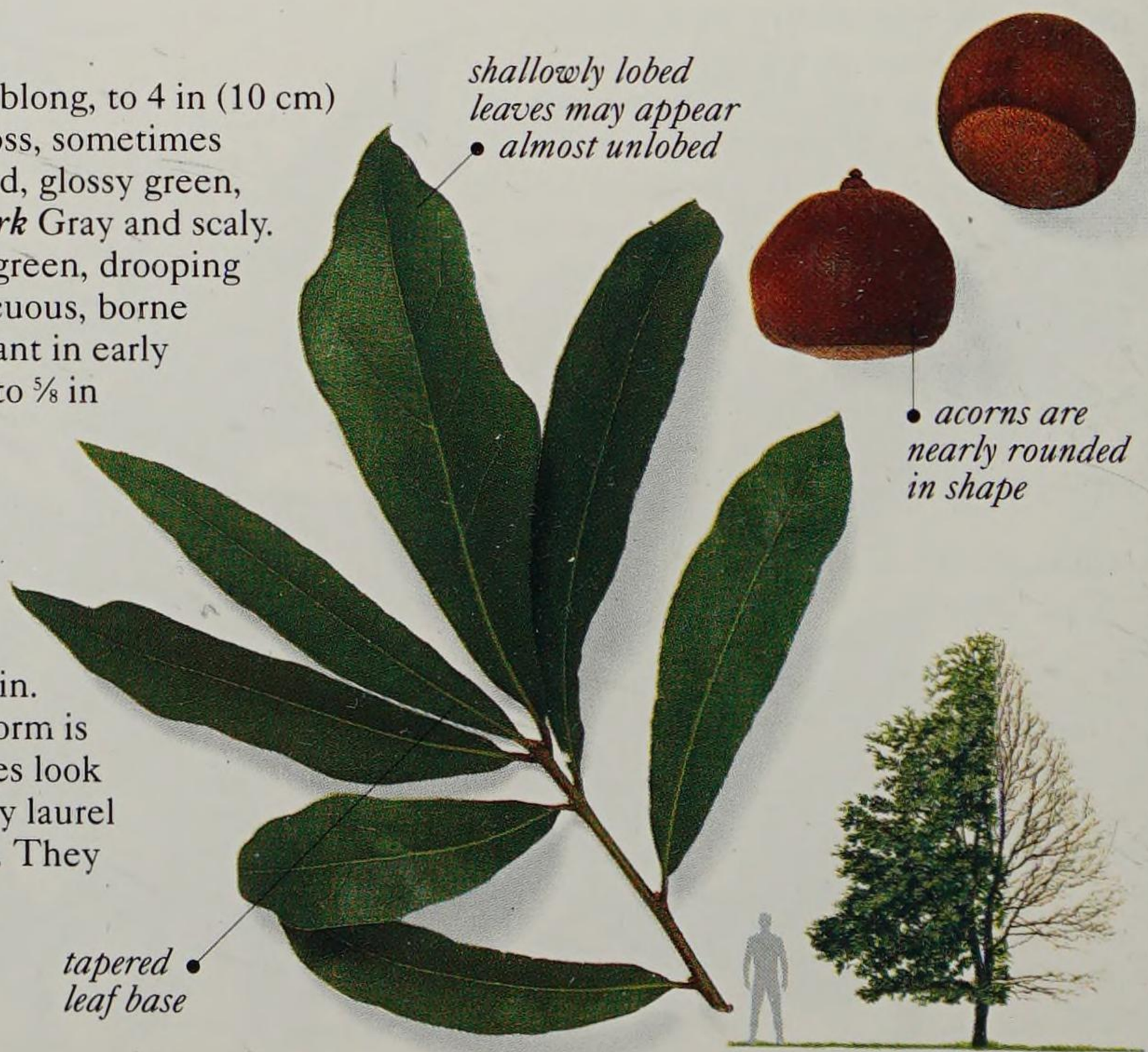
LAUREL OAK

Leaves Oblanceolate to oblong, to 4 in (10 cm) long and 1½ in (4 cm) across, sometimes shallowly lobed, untoothed, glossy green, smooth on both sides. ***Bark*** Gray and scaly. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, borne separately on the same plant in early summer. ***Fruit*** An acorn, to ⅝ in (1.5 cm) long, one-third enclosed in a cup.

• **NATIVE REGION** S.E. United States.

• **HABITAT** Woods, sandy soil, and swamp margins on the coastal plain.

• **REMARK** A selected form is Darlington oak. The leaves look rather like those of the bay laurel *(Laurus nobilis*, see p.188). They persist through autumn into winter, giving the tree a semi-evergreen appearance.



Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

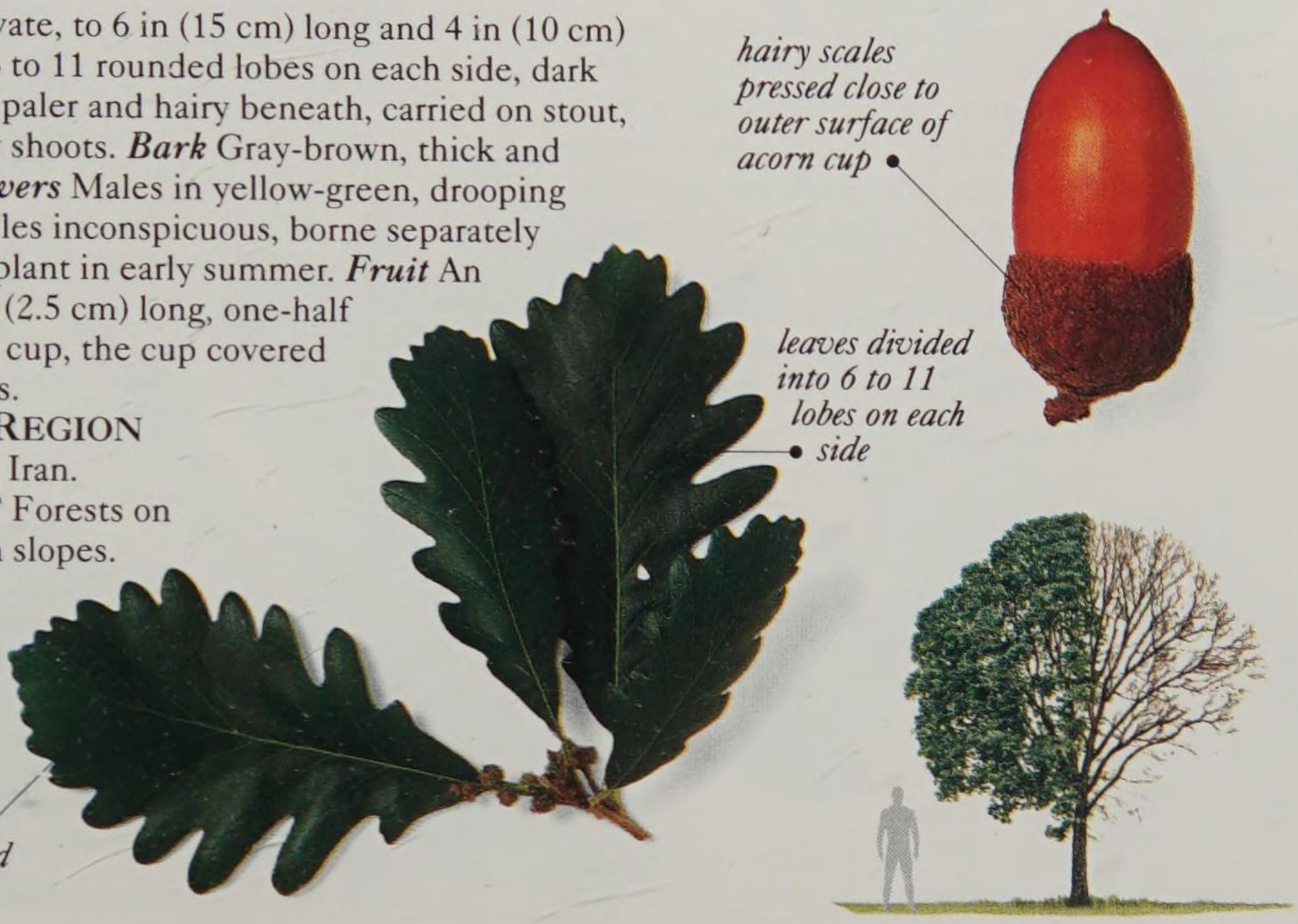
Family FAGACEAE	Species *Quercus macranthera*	Author Fischer & C.A. Meyer

QUERCUS MACRANTHERA

Leaves Obovate, to 6 in (15 cm) long and 4 in (10 cm) across, with 6 to 11 rounded lobes on each side, dark green above, paler and hairy beneath, carried on stout, densely hairy shoots. ***Bark*** Gray-brown, thick and fissured. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, borne separately on the same plant in early summer. ***Fruit*** An acorn, to 1 in (2.5 cm) long, one-half enclosed in a cup, the cup covered in hairy scales.

• **NATIVE REGION**
Caucasus, N. Iran.

• **HABITAT** Forests on dry mountain slopes.



Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus macrocarpa*	Author A. Michaux

BURR OAK

Leaves Obovate, to 10 in (25 cm) long and 4¾ in (12 cm) across, deeply cut into round-ended lobes, with a distinct, broad sinus toward the base, glossy green and smooth above, paler and hairy beneath. ***Bark*** Gray, rough, deeply furrowed. ***Flowers*** Males in yellow, drooping catkins, females inconspicuous, borne separately on the same plant in early summer. ***Fruit*** An acorn, to 2 in (5 cm) long, one-half or more enclosed in a cup, the cup rimmed with a fringe of scales.

• **NATIVE REGION**
E. North America.

• **HABITAT** Rich woods.

• **REMARK** Also known as blue oak, mossy cup oak. The acorns are larger than those of any other North American oak.

Height 130 ft (40 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus marilandica*	Author Münchhausen

BLACK JACK OAK

Leaves Triangular-obovate, to 10 in (25 cm) long and nearly the same across at the tip, tapered at the base, usually with three bristle-pointed lobes at the tip, glossy dark green above, paler beneath, thinly hairy becoming nearly smooth on both sides. ***Bark*** Blackish, cracking into small, square plates. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, borne separately on the same plant in early summer. ***Fruit*** An acorn, to ¾ in (2 cm) long, about one-half enclosed in a cup.

• **NATIVE REGION**
E. United States.

• **HABITAT** Woods and poor, often sandy soil.

Height 40 ft (12 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

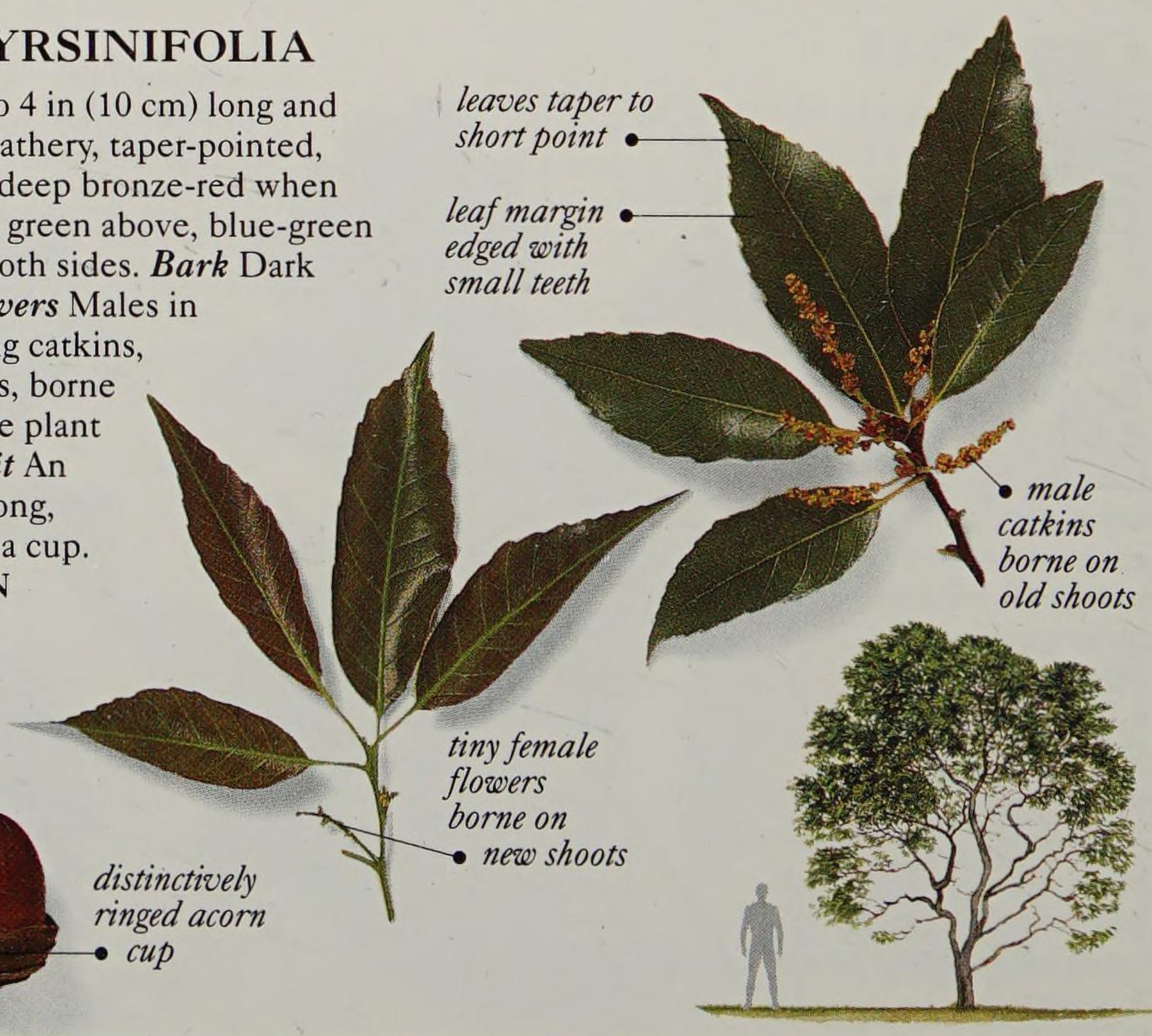
Family FAGACEAE	Species *Quercus myrsinifolia*	Author Blume

QUERCUS MYRSINIFOLIA

Leaves Lanceolate, to 4 in (10 cm) long and 1¼ in (3 cm) across, leathery, taper-pointed, with few small teeth, deep bronze-red when young becoming dark green above, blue-green beneath, smooth on both sides. ***Bark*** Dark gray and smooth. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, borne separately on the same plant in early summer. ***Fruit*** An acorn, to ¾ in (2 cm) long, one-third enclosed in a cup.

• **NATIVE REGION**
China, Japan.

• **HABITAT** Forests.



Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

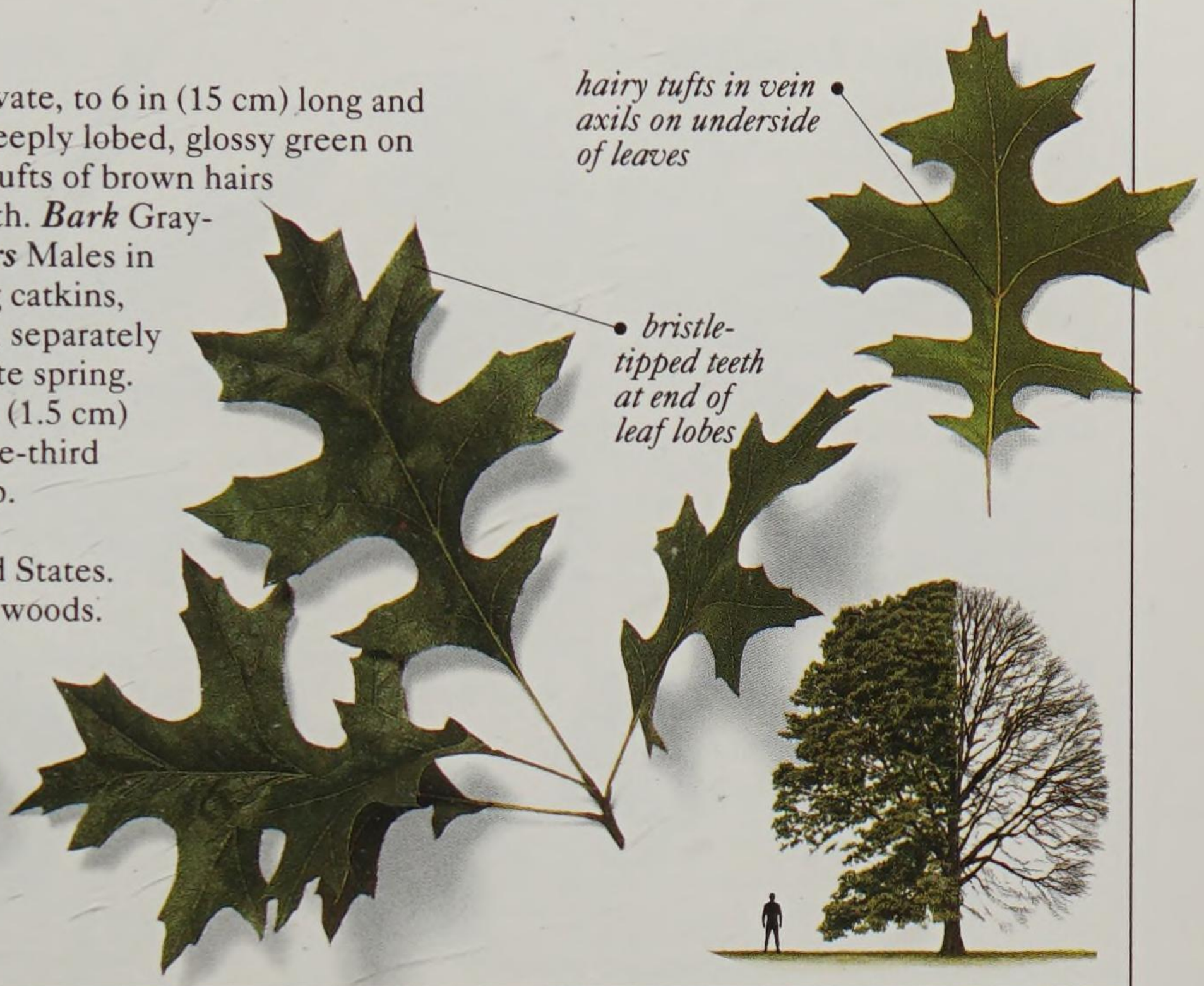
Family FAGACEAE	Species *Quercus palustris*	Author Münchhausen

PIN OAK

Leaves Elliptic to obovate, to 6 in (15 cm) long and 4¾ in (12 cm) across, deeply lobed, glossy green on both sides, paler with tufts of brown hairs in the vein axils beneath. ***Bark*** Gray-brown, smooth. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, separately on the same plant in late spring. ***Fruit*** An acorn, to ⅝ in (1.5 cm) long, one-quarter to one-third enclosed in a broad cup.

• **NATIVE REGION**
S.E. Canada, E. United States.

• **HABITAT** Swampy woods.



Height 100 ft (30 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus petraea*	Author (Mattuschka) Lieblein

DURMAST OAK

Leaves Elliptic, to 4¾ in (12 cm) long and 3 in (7.5 cm) across, with rounded lobes, usually tapered at the base, without auricles, slightly glossy dark green and smooth above, paler and thinly hairy beneath, the stalk to ⅜ in (1 cm) or more long. ***Bark*** Gray, with vertical ridges. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, borne separately on the same plant in late spring. ***Fruit*** An acorn, to 1¼ in (3 cm) long, about one-third enclosed in a cup.

• **NATIVE REGION** Europe.

• **HABITAT** Woods.

• **REMARK** Also known as sessile oak.

Height 130 ft (40 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus phellos*	Author Linnaeus

WILLOW OAK

Leaves Narrowly oblong, to 4 in (10 cm) long and 1 in (2.5 cm) across, ending in a small, fine point, untoothed, bright green above, paler beneath, smooth on both sides. ***Bark*** Gray and smooth, becoming ridged and cracking into plates with age. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, borne separately on the same plant in late spring. ***Fruit*** An acorn, to ⅝ in (1.5 cm) long, about one-quarter enclosed in a shallow cup.

• **NATIVE REGION** E. United States.
• **HABITAT** Moist and swampy soil.
• **REMARK** Easily distinguished by its leaves, which look very similar to those of certain willows *(Salix*, see pp.291–294).

Height 100 ft (30 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus phillyreoides*	Author Gray

UBAME OAK

Leaves Elliptic to oblong, to 2½ in (6 cm) long, leathery, toothed to untoothed, often bronze-tinged at first becoming dark green above, paler and glossy beneath, smooth on both sides. ***Bark*** Dark gray, with vertical, shallow fissures. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, separately on the same plant in late spring. ***Fruit*** An acorn, to ¾ in (2 cm) long, about one-third enclosed in a cone-shaped cup.

• **NATIVE REGION** China, S. Japan.
• **HABITAT** Cliffs and rocky places.
• **REMARK** A rarely seen and unusual small tree or shrub.

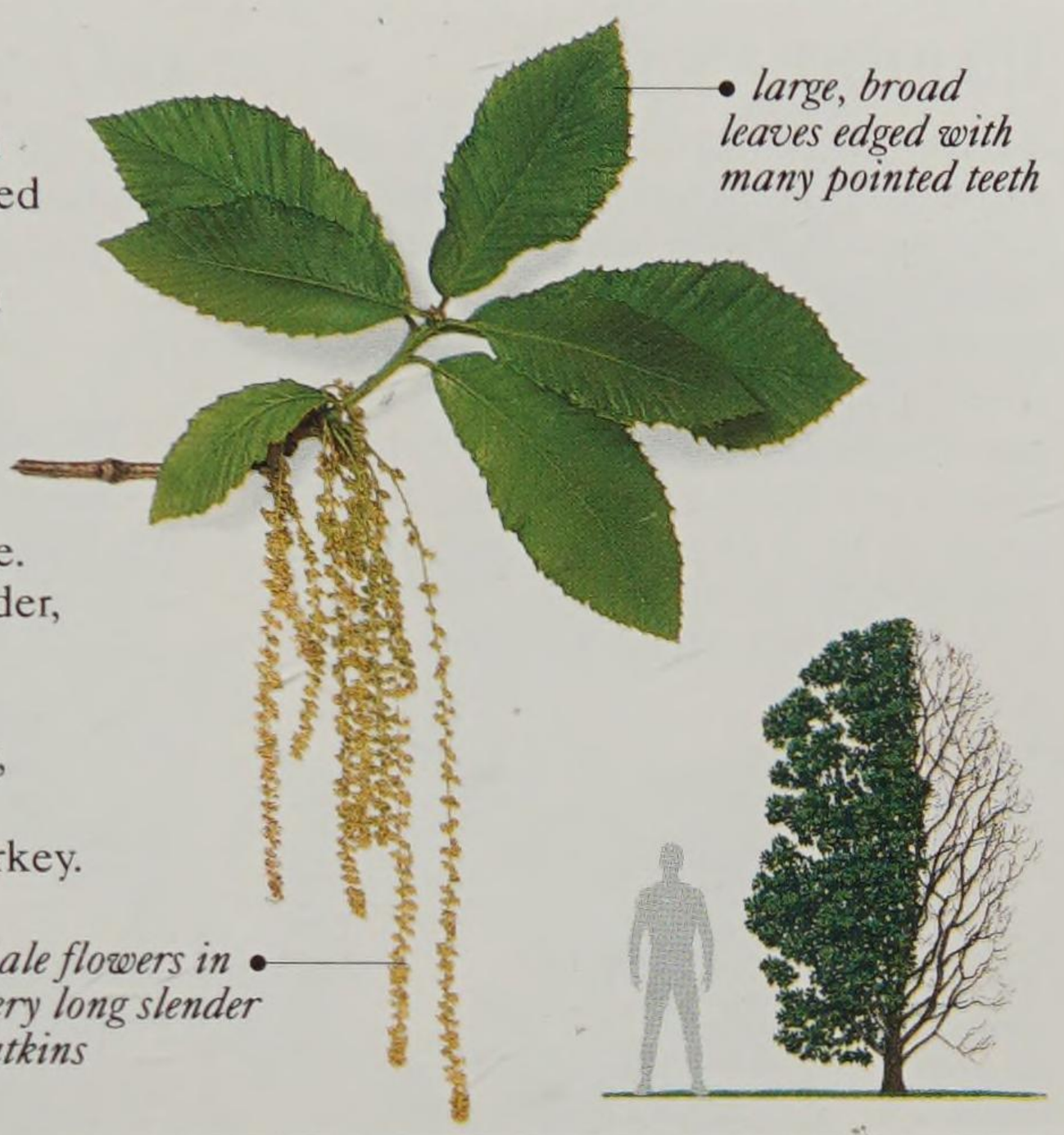
Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

Family FAGACEAE	Species *Quercus pontica*	Author K. Koch

ARMENIAN OAK

Leaves Obovate to broadly elliptic, to 6 in (15 cm) long and 4 in (10 cm) across, tapered at the base, the numerous parallel veins ending in small, pointed teeth, hairy when young becoming bright green and smooth above, blue-green beneath, turning yellow-brown in autumn, carried on stout shoots. ***Bark*** Gray to purple-brown and thinly scaly, becoming rugged with age. ***Flowers*** Males in yellow-green, long, slender, drooping catkins, females inconspicuous, borne separately on the same plant in late spring. ***Fruit*** An acorn, to ¾ in (2 cm) long, one-half enclosed in a cup.

- **NATIVE REGION** Caucasus, N.E. Turkey.
- **HABITAT** Mountain woods.
- **REMARK** This species can be either a very small tree or a bushy shrub.



Height 20 ft (6 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus pubescens*	Author Willdenow

QUERCUS PUBESCENS

Leaves Elliptic to obovate, to 4 in (10 cm) long and 2 in (5 cm) across, with rounded lobes, the lobes ending in a small, sharp point, dark gray-green above, downy beneath, softly gray-hairy at least when young becoming nearly smooth on both sides. ***Bark*** Dark gray and deeply furrowed. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, borne separately on the same plant in late spring. ***Fruit*** An acorn, to 1½ in (4 cm) long, about one-third enclosed in a cup, the cup covered in hairy scales.

- **NATIVE REGION** W. Asia, C. and S. Europe.
- **HABITAT** Dry places in hills.

Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus pyrenaica*	Author Willdenow

PYRENEAN OAK

Leaves Elliptic to obovate, to 8 in (20 cm) long and 4 in (10 cm) across, deeply lobed, often untoothed, hairy on both sides when young becoming deep glossy green and nearly smooth above, hairy beneath. ***Bark*** Pale gray and craggy. ***Flowers*** Males in yellow, drooping catkins, females inconspicuous, borne separately on the same plant in early summer. ***Fruit*** An acorn, to 1½ in (4 cm) long, one-third to one-half enclosed in a cup.

• **NATIVE REGION** N. Africa, S.W. Europe.

• **HABITAT** Mountain woods.

Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus robur*	Author Linnaeus

ENGLISH OAK

Leaves Elliptic to obovate, to 4¾ in (12 cm) long and 3 in (7.5 cm) across, with three to six lobes on each side, dark green above, blue-green beneath, becoming smooth. ***Bark*** Pale gray and fissured. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, separately on the same plant in late spring. ***Fruit*** An acorn, to 1½ in (4 cm) long, one-third enclosed in a cup.

• **NATIVE REGION** Europe.

• **HABITAT** Woods.

'ATROPURPUREA' ∇
This slower-growing form has ornamental foliage.

◁ 'CONCORDIA'
The bright yellow spring leaves of this form turn green after midsummer.

Height 115 ft (35 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus rubra*	Author Linnaeus

RED OR NORTHERN RED OAK

Leaves Elliptic, ovate, or obovate, to 8 in (20 cm) long and 6 in (15 cm) across, with slender-toothed lobes, matte dark green and smooth above, paler and smooth with small tufts of brown hairs in the vein axils beneath, turning red-brown in autumn. ***Bark*** Gray and smooth, becoming deeply furrowed. ***Flowers*** Males in yellowish green, drooping catkins, females inconspicuous, separately on the same plant in late spring. ***Fruit*** An acorn, to 1¼ in (3 cm) long, one-quarter enclosed in a shallow cup.

• **NATIVE REGION**
E. North America.

• **HABITAT** Woods, and mountains in the south of its region.

Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus stellata*	Author Wangenheim

POST OAK

Leaves Obovate, to 8 in (20 cm) long and 4 in (10 cm) across, with two or three pairs of lobes, the central pair at least broad and often narrowed at the base, dark green and rough above, gray-hairy beneath. ***Bark*** Gray-brown, ridged, flaky. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, separately on the same plant in late spring. ***Fruit*** An acorn, to 1¼ in (3 cm) long, about one-third enclosed in a cup.

• **NATIVE REGION**
C. and E. United States.

• **HABITAT**
Dry soil.

Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus suber*	Author Linnaeus

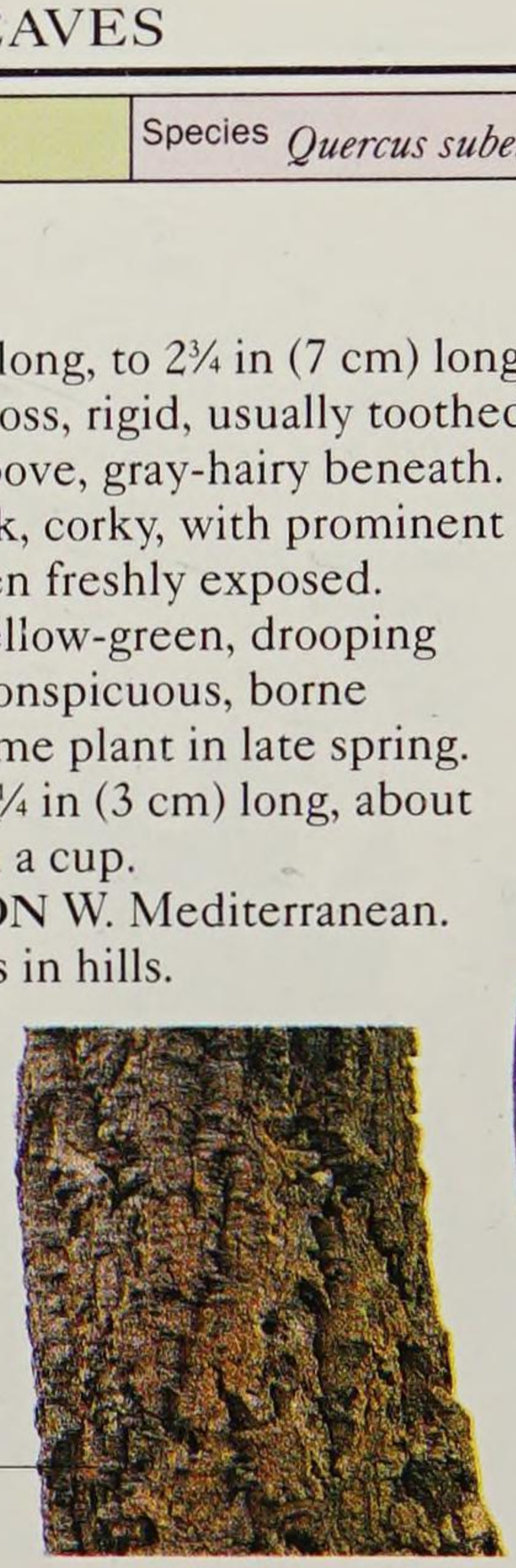
CORK OAK

Leaves Ovate to oblong, to 2¾ in (7 cm) long and 1½ in (4 cm) across, rigid, usually toothed, glossy dark green above, gray-hairy beneath. ***Bark*** Pale gray, thick, corky, with prominent ridges; dark red when freshly exposed. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, borne separately on the same plant in late spring. ***Fruit*** An acorn, to 1¼ in (3 cm) long, about one-half enclosed in a cup.

• **NATIVE REGION** W. Mediterranean.

• **HABITAT** Woods in hills.

• **REMARK** Striping the bark, from which cork is produced in Portugal and Spain, does not damage the living tissue of the plant.



thick, but light corky bark

Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

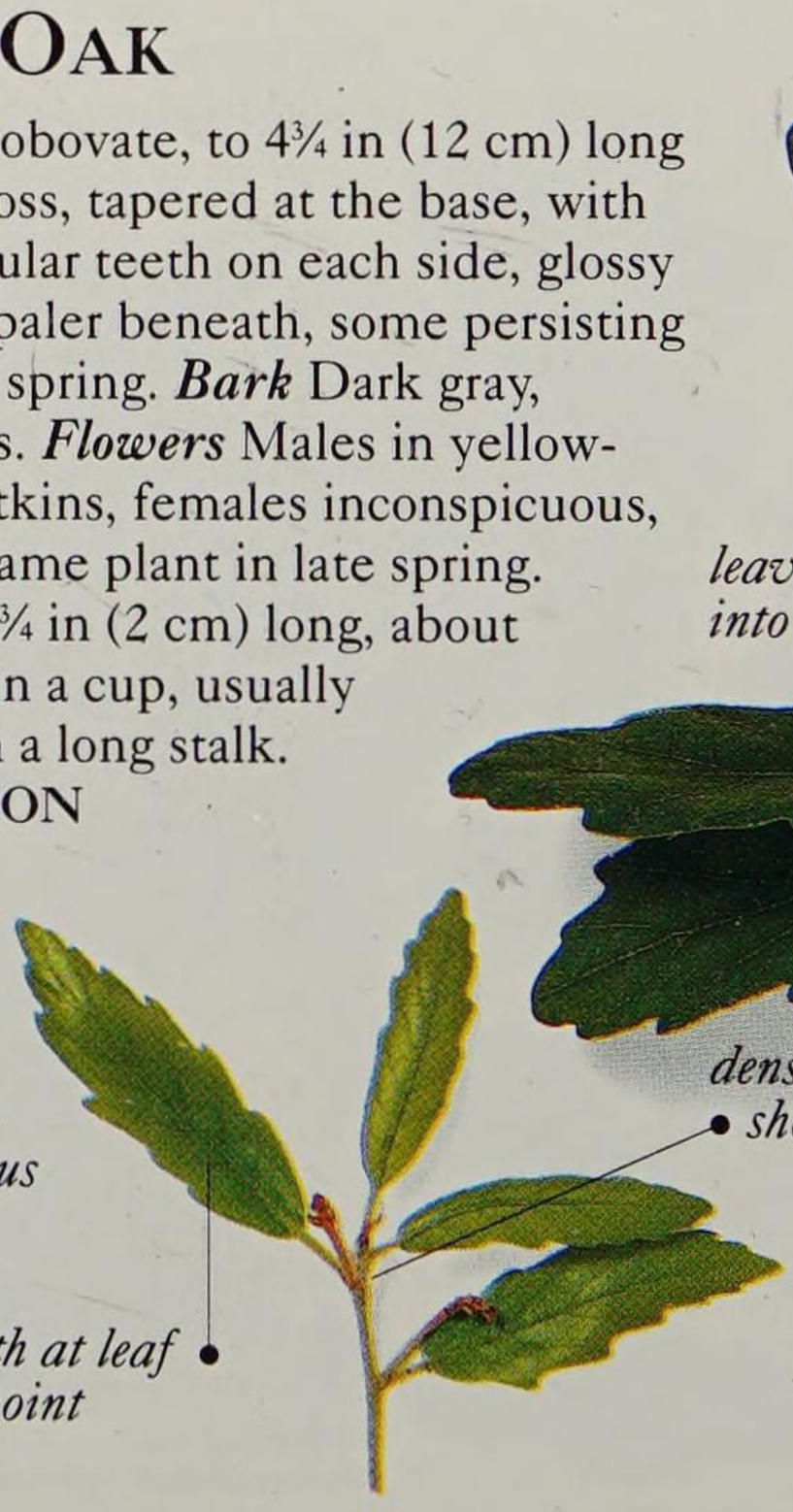
Family FAGACEAE	Species *Quercus* x *turneri*	Author Willdenow

TURNER'S OAK

Leaves Oblong to obovate, to 4¾ in (12 cm) long and 2 in (5 cm) across, tapered at the base, with three to five triangular teeth on each side, glossy dark green above, paler beneath, some persisting until the following spring. ***Bark*** Dark gray, cracking into plates. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, separately on the same plant in late spring. ***Fruit*** An acorn, to ¾ in (2 cm) long, about one-half enclosed in a cup, usually several together on a long stalk.

• **NATIVE REGION** Of garden origin.

• **REMARK** A hybrid between holm oak *(Quercus ilex*, see p.163) and English oak *(Quercus robur*, see p.170).



Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family FAGACEAE	Species *Quercus variabilis*	Author Blume

QUERCUS VARIABILIS

Leaves Oblong, to 8 in (20 cm) long and 2 in (5 cm) across, pointed at the tip, with numerous parallel veins ending in bristle-tipped teeth, glossy dark green and smooth above, gray and thinly hairy beneath. ***Bark*** Pale gray-brown, thick and corky, deeply fissured. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, separately on the same plant in late spring. ***Fruit*** An acorn, to ¾ in (2 cm) long, almost enclosed in a cup, the cup covered in long, curly scales.

• **NATIVE REGION**
China, Japan, Korea.

• **HABITAT**
Mountain woods.

Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

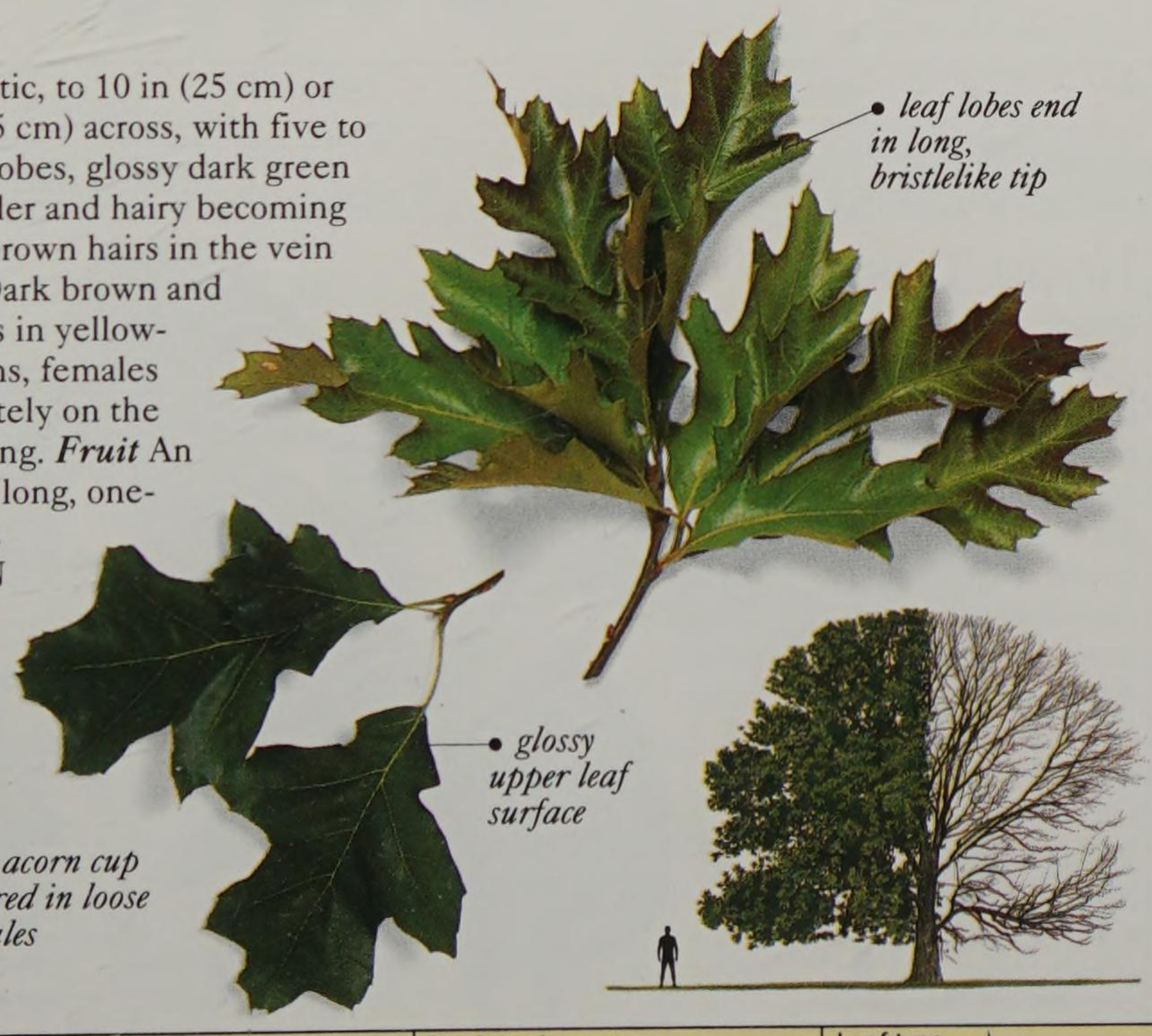
Family FAGACEAE	Species *Quercus velutina*	Author Lamarck

BLACK OAK

Leaves Ovate to elliptic, to 10 in (25 cm) or more long and 6 in (15 cm) across, with five to seven finely pointed lobes, glossy dark green and smooth above, paler and hairy becoming smooth with tufts of brown hairs in the vein axils beneath. ***Bark*** Dark brown and ridged. ***Flowers*** Males in yellow-green, drooping catkins, females inconspicuous, separately on the same plant in late spring. ***Fruit*** An acorn, to 1 in (2.5 cm) long, one-half enclosed in a cup.

• **NATIVE REGION**
E. North America.

• **HABITAT** Dry woods, sand dunes.



Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

FLACOURTIACEAE

THIS LARGELY TROPICAL and subtropical family occurs in both hemispheres and contains about 90 genera and 900 species of evergreen and deciduous trees and shrubs. As well as the plants described here, the family includes species of the Southeast Asian genus, *Hydnocarpus*. These yield chaulmoogra oil, which is used to treat some skin diseases.

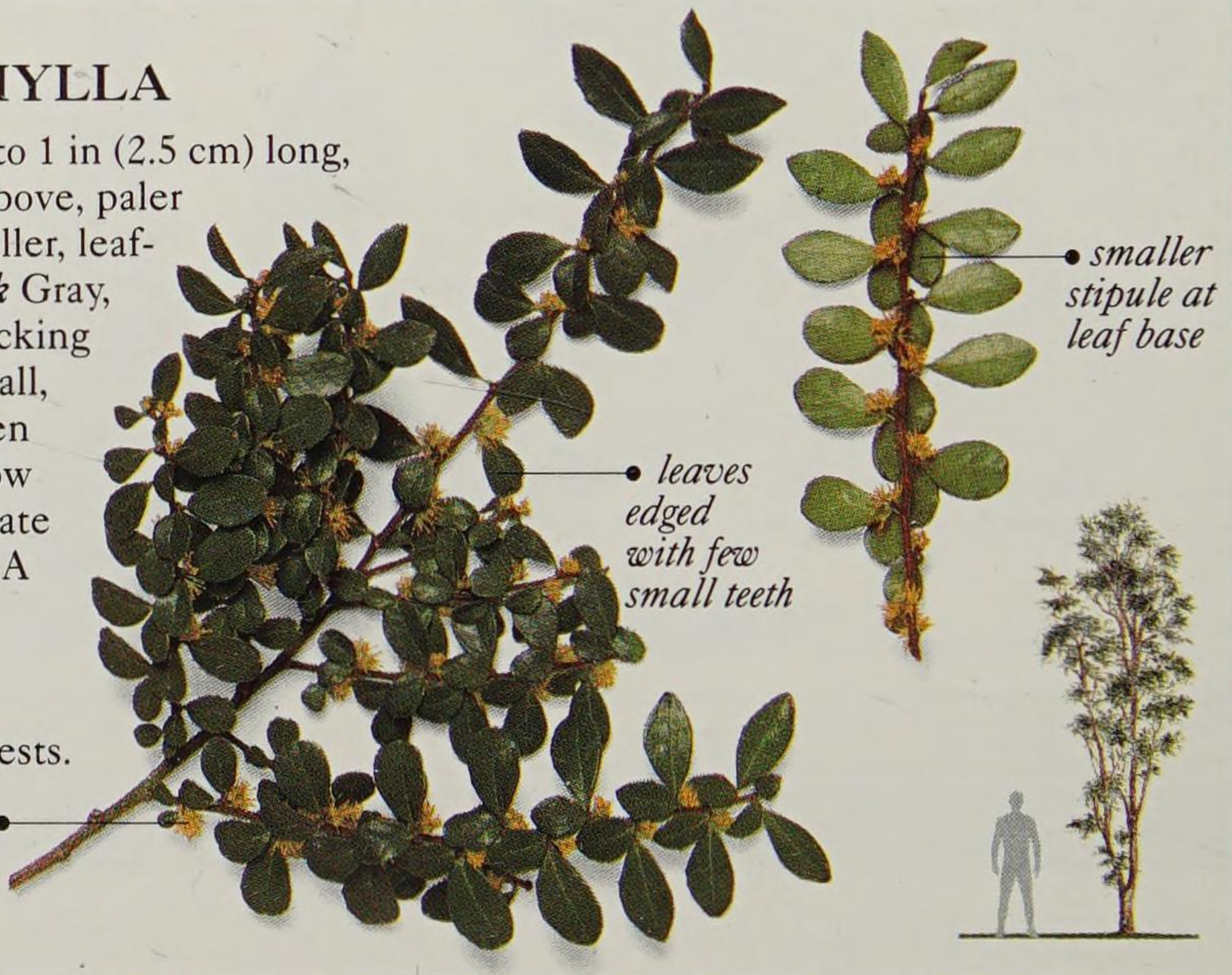
Family FLACOURTIACEAE	Species *Azara microphylla*	Author J.D. Hooker

AZARA MICROPHYLLA

Leaves Obovate to elliptic, to 1 in (2.5 cm) long, toothed, glossy dark green above, paler beneath, smooth, with a smaller, leaf-like stipule at the base. ***Bark*** Gray, with horizontal lenticels, cracking into thin flakes. ***Flowers*** Small, without petals, but with green sepals and conspicuous yellow stamens, in the leaf axils in late winter or early spring. ***Fruit*** A small, orange-red berry.

• **NATIVE REGION**
Argentina, Chile.

• **HABITAT** Deciduous forests.



Height 33 ft (10 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

Family FLACOURTIACEAE	Species *Idesia polycarpa*	Author Maximowicz

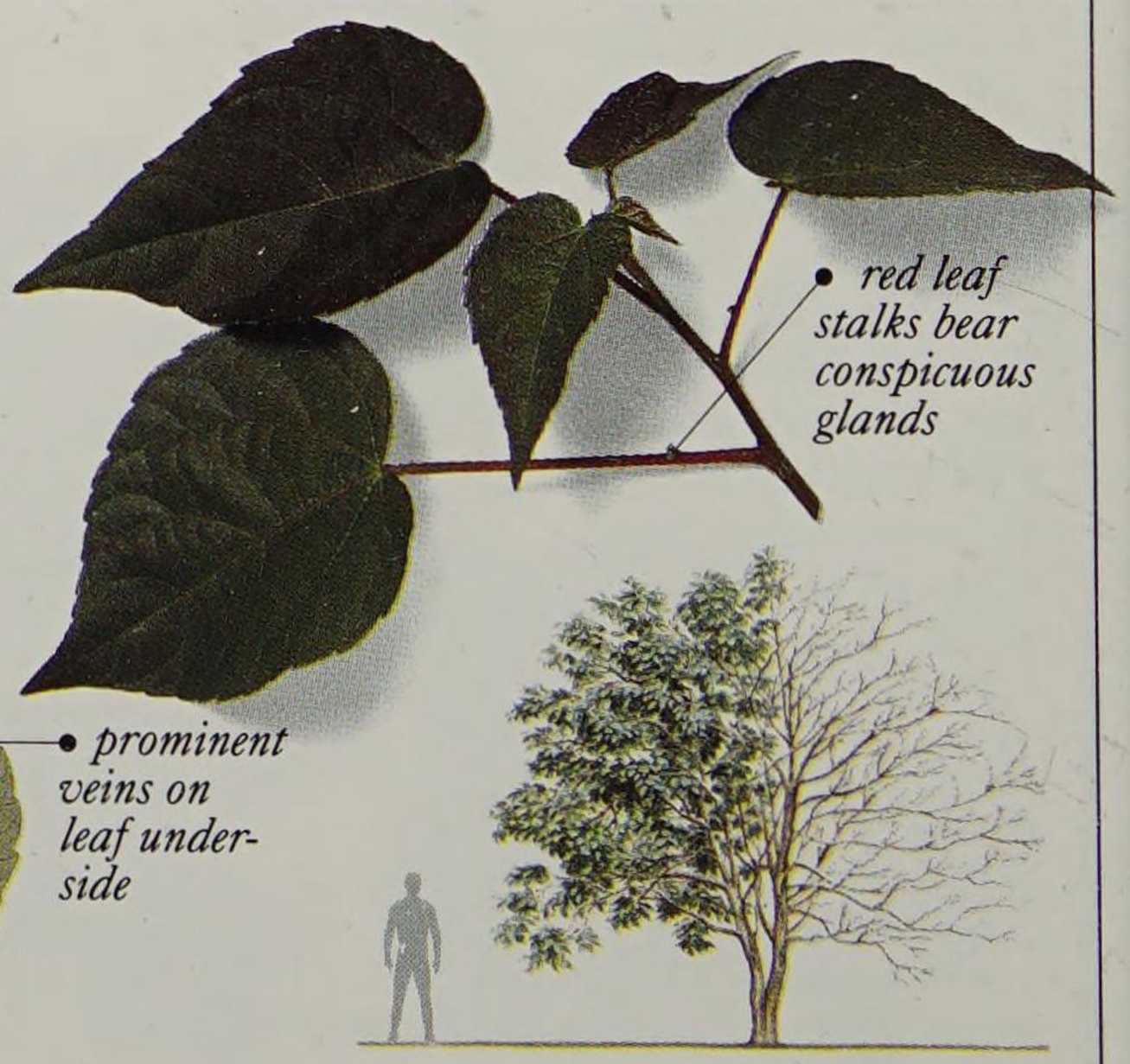
IIGIRI TREE

Leaves Broadly heart-shaped, to 8 in (20 cm) long and nearly the same across, heart-shaped at the base, with a short, tapered tip, toothed, bronze-purple becoming dark green above, blue-white beneath, smooth, on long stalks. ***Bark*** Gray-white. ***Flowers*** Small and yellow-green, without petals, in large, drooping panicles at the ends of the shoots, on separate plants in early summer. ***Fruit*** A small, red berry, borne in hanging clusters.

• **NATIVE REGION**
China, Japan.

• **HABITAT**
Mountain slopes.

• **REMARK** Favors sunny situations.



Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

HAMAMELIDACEAE

A FAMILY OF ABOUT 25 genera and 100 species of deciduous and evergreen trees and shrubs, distributed widely in temperate and subtropical regions, yet unknown in the wild throughout Europe, most of South America, and Africa. In addition to the five species described here, this family contains genera of ornamental shrubs, such as the witch hazels *(Hamamelis)*, flowering in late winter, *Corylopsis*, and *Fothergilla*, flowering in early spring.

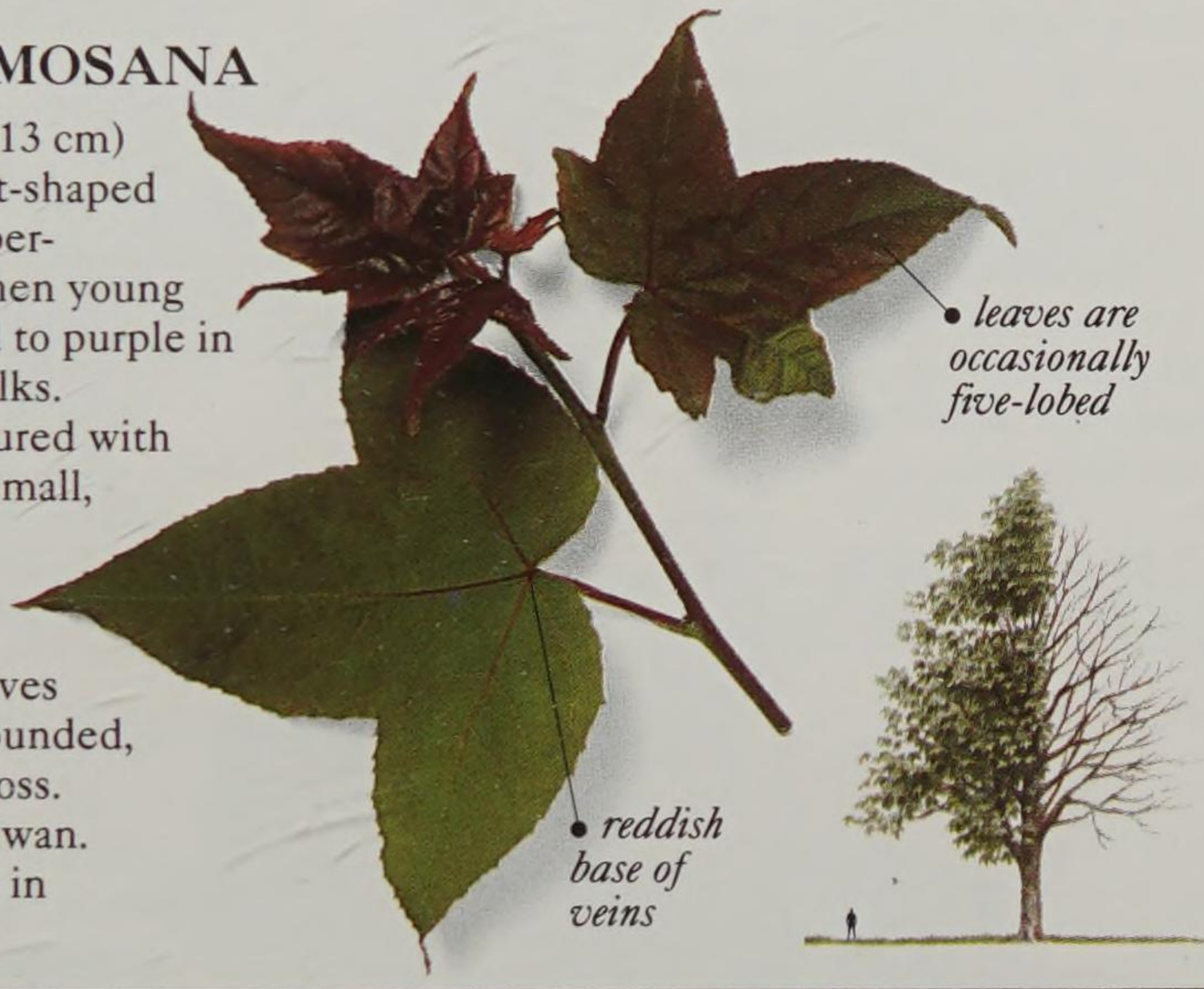
Family HAMAMELIDACEAE	Species *Liquidambar formosana*	Author Hance

LIQUIDAMBAR FORMOSANA

Leaves Palmately lobed, to 5 in (13 cm) long and 6 in (15 cm) across, heart-shaped at the base, usually with three taper-pointed, toothed lobes, purple when young becoming dark green, turning red to purple in autumn, carried on red-tinged stalks. ***Bark*** Gray-white, darker and fissured with age. ***Flowers*** Males and females small, yellow-green, without petals, borne in separate, rounded heads on the same plant in spring at the same time as the leaves emerge. ***Fruit*** Small, brown, in rounded, hanging clusters, 1½ in (4 cm) across.

• **NATIVE REGION** China, Taiwan.

• **HABITAT** Woods and thickets in mountainous areas.



Height 130 ft (40 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

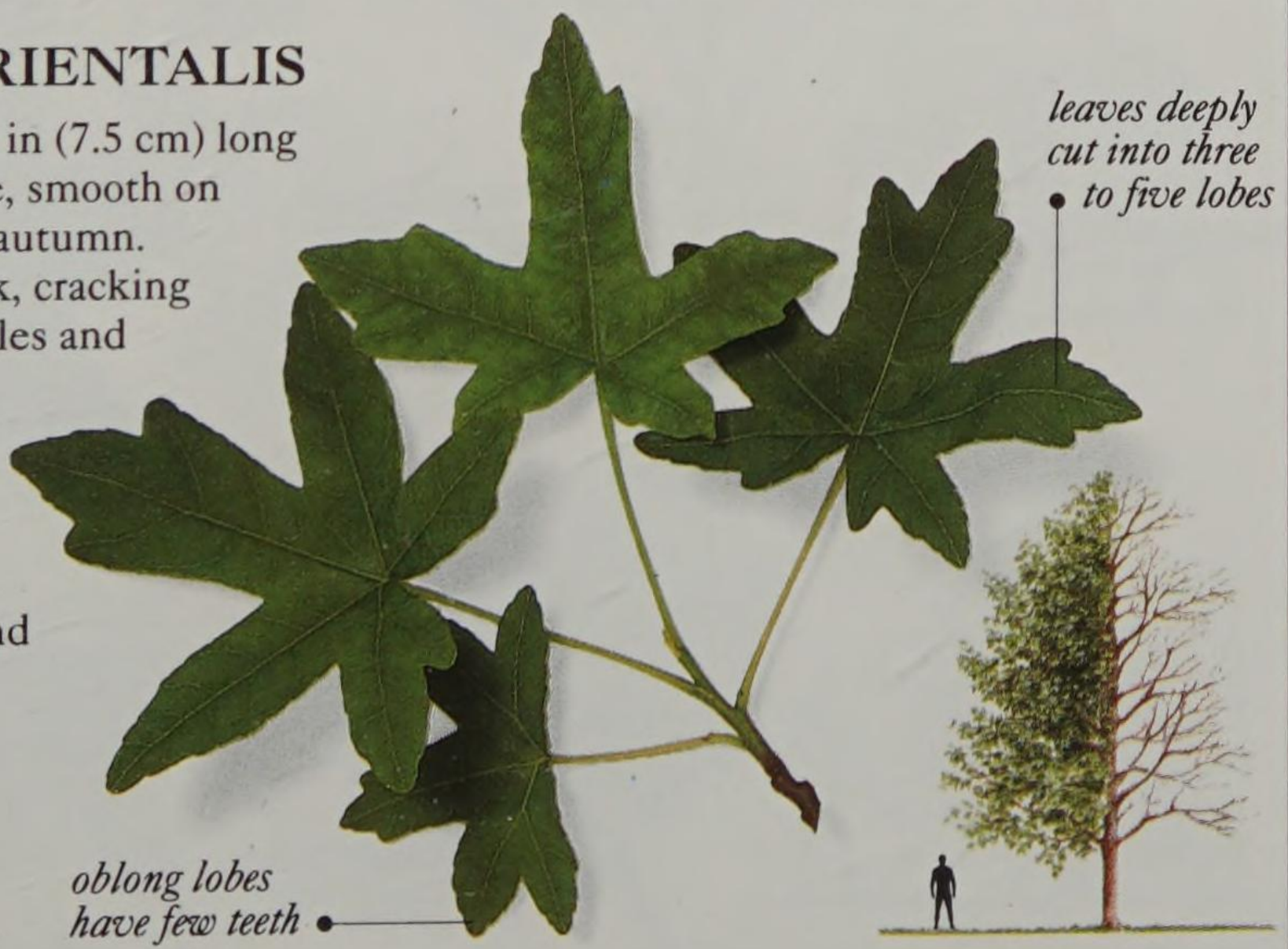
Family HAMAMELIDACEAE	Species *Liquidambar orientalis*	Author Miller

LIQUIDAMBAR ORIENTALIS

Leaves Palmately lobed, to 3 in (7.5 cm) long and across, matte green above, smooth on both sides, turning orange in autumn. ***Bark*** Orange-brown and thick, cracking into small plates. ***Flowers*** Males and females both very small and yellow-green, without petals, borne in separate, rounded heads on the same plant in spring as the young leaves emerge. ***Fruit*** Small and brown, in rounded, hanging clusters, 1 in (2.5 cm) across.

• **NATIVE REGION** S.W. Turkey.

• **HABITAT** Moist woods, floodplains, and streamsides.



Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family HAMAMELIDACEAE	Species *Liquidambar styraciflua*	Author Linnaeus

SWEET GUM

Leaves Palmately lobed, to 6 in (15 cm) long and across, with five or seven taper-pointed, finely toothed lobes, glossy green above, turning orange to red or purple in autumn, borne on often corky-winged shoots. ***Bark*** Dark gray-brown, deeply furrowed, with narrow ridges. ***Flowers*** Males and females both very small and yellow-green, without petals, in separate, rounded heads in late spring as the leaves emerge. ***Fruit*** Individually small and brown, borne in rounded, hanging clusters, 1½ in (4 cm) across.

• **NATIVE REGION** C. America, Mexico, E. United States.

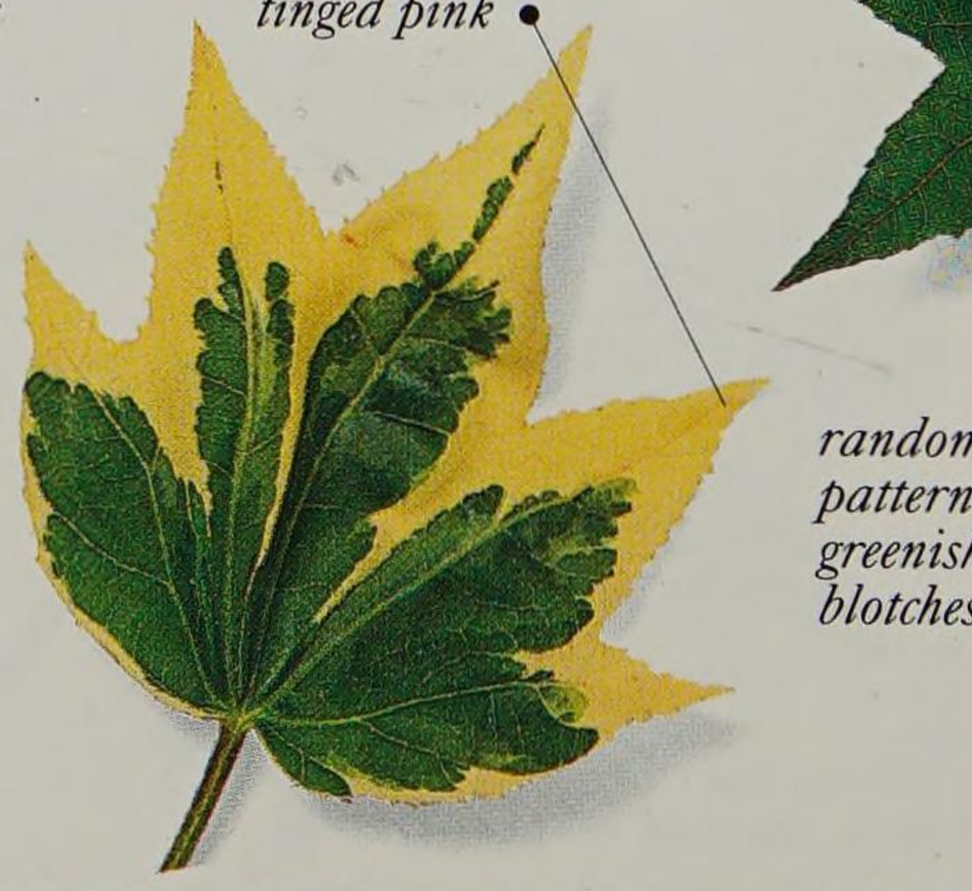
• **HABITAT** Moist woods.

• **REMARK** Easily distinguished from the maples *(Acer*, see pp.84–104) by its alternate, rather than opposite, leaves.

Δ **LIQUIDAMBAR STYRACIFLUA**

Δ **'LANE ROBERTS'**
The leaves of this form invariably turn shades of orange to deep red-purple after midsummer.

∇ **'VARIEGATA'**
Paler green and yellowish blotches and streaks mark the leaves of this variety. This distinct form has also been known as 'Aurea,' and has been confused with 'Silver King.'



'SILVER KING' ▷
This form is selected for its attractive foliage. The broad, creamy white to yellow leaf margin is often tinged pink in autumn.

Height 130 ft (40 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family HAMAMELIDACEAE	Species *Parrotia persica*	Author (Candolle) C.A. Meyer

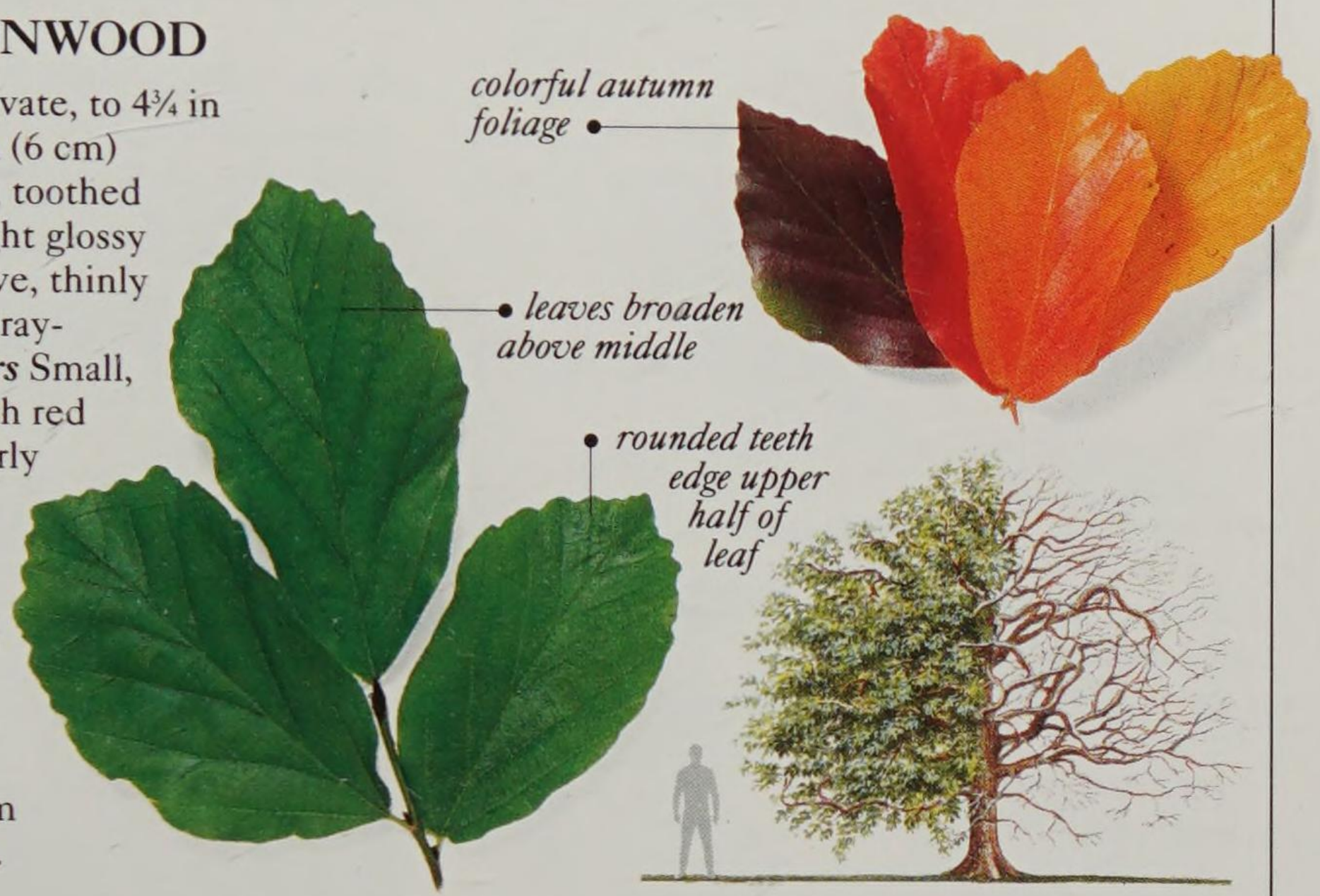
PERSIAN IRONWOOD

Leaves Elliptic to obovate, to 4¾ in (12 cm) long and 2½ in (6 cm) across, wavy at margin, toothed above the middle, bright glossy green and smooth above, thinly hairy beneath. ***Bark*** Gray-brown, flaking. ***Flowers*** Small, without petals, but with red anthers in winter to early spring. ***Fruit*** Nutlike brown capsule, 5/16 in (8 mm) long.

• **NATIVE REGION** E. Caucasus, N. Iran.

• **HABITAT** Forests.

• **REMARK** Can be either a tree of medium height or a large shrub.



Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family HAMAMELIDACEAE	Species *Parrotiopsis jacquemontiana*	Author (Decaisne) Rehder

PARROTIOPSIS JACQUEMONTIANA

Leaves Rounded, to 3 in (7.5 cm) long, toothed, glossy green becoming smooth or nearly so above, hairy beneath, carried on short stalks. ***Bark*** Gray and smooth. ***Flowers*** Small and without petals, with numerous stamens, the stamens with yellow anthers, borne in dense clusters, each cluster surrounded by up to six white bracts, the bracts dotted with numerous tiny brown scales beneath, forming a head to 2 in (5 cm) across, in mid- to late spring. ***Fruit*** A small bristly, brown capsule, borne in clusters.

• **NATIVE REGION** W. Himalayas.

• **HABITAT** Forests.

• **REMARK** This shrublike plant is the only species of *Parrotiopsis*. Flowers usually persist to early or midsummer.

Height 20 ft (6 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

HIPPOCASTANACEAE

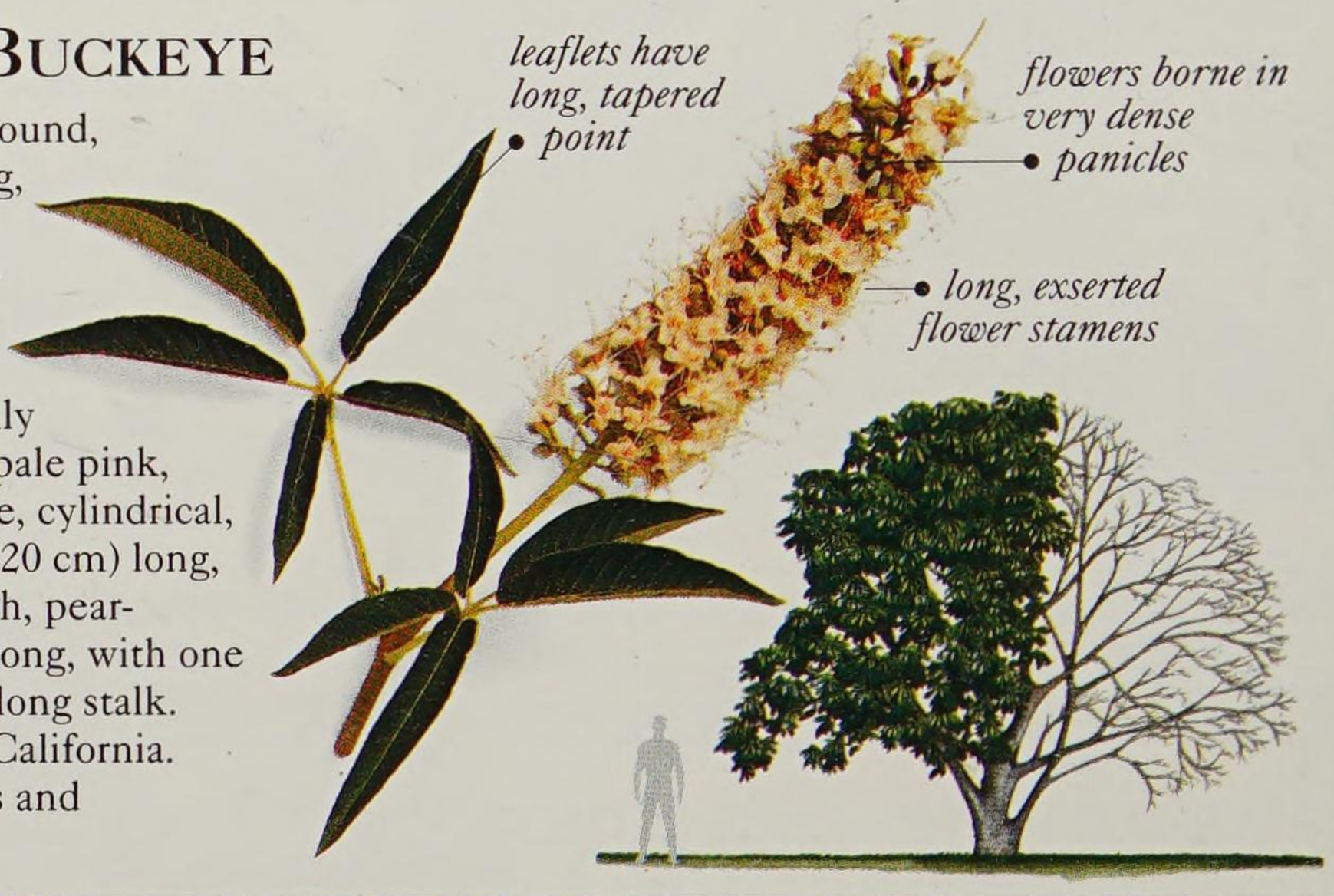
THIS FAMILY HAS ONLY two genera. Its 15 species of deciduous trees and shrubs are native plants in North America, southeast Europe, and east Asia. They have palmately compound, opposite leaves, and conspicuous, four- or five-petaled flowers, borne in large clusters at the ends of the shoots.

Family HIPPOCASTANACEAE	Species *Aesculus californica*	Author (Spach) Nuttall

CALIFORNIA BUCKEYE

Leaves Palmately compound, with five to seven oblong, toothed leaflets, to 6 in (15 cm) long, deep blue-green above, gray-green beneath. ***Bark*** Pale gray, nearly smooth, thinly scaly. ***Flowers*** White or pale pink, with four petals, in dense, cylindrical, upright panicles to 8 in (20 cm) long, in summer. ***Fruit*** Smooth, pear-shaped, to 2¾ in (7 cm) long, with one glossy brown seed, on a long stalk.

- **NATIVE REGION**: California.
- **HABITAT** Dry slopes and canyons in hills.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family HIPPOCASTANACEAE	Species *Aesculus* x *carnea*	Author Hayne

RED HORSE CHESTNUT

Leaves Palmately compound, with five to seven obovate, sharply toothed, stalkless or short-stalked leaflets, to 10 in (25 cm) long, dark green, on long stalks. ***Bark*** Reddish brown. ***Flowers*** Creamy white blotched yellow becoming pink blotched red, with five petals, in conical, upright, or slightly spreading panicles to 8 in (20 cm) long, in late spring. ***Fruit*** Smooth or only slightly spiny, 1½ in (4 cm) across.

- **NATIVE REGION** Of garden origin.
- **REMARK** A hybrid between common horse chestnut (*Aesculus hippocastanum*, see p.179) and red buckeye (*Aesculus pavia*, see p.181).

◁ **'BRIOTII'**
Brighter red flowers distinguish this form.

Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family HIPPOCASTANACEAE	Species *Aesculus octandra*	Author Marsh

SWEET BUCKEYE

Leaves Palmately compound, usually with five sharply toothed, short-stalked leaflets, to 6 in (15 cm) long, dark green, turning orange-red in autumn. ***Bark*** Gray-brown, peeling in large, smooth scales. ***Flowers*** Yellow, with four petals, in conical, upright panicles to 6 in (15 cm) long, in late spring to early summer. ***Fruit*** Smooth, rounded, to 2½ in (6 cm) across, covered in brown scales, usually with two seeds.

- **NATIVE REGION** E. United States.
- **HABITAT** Moist, rich woods.
- **REMARK** Also known as *Aesculus flava*, yellow buckeye. The best buckeye for autumn color.

Height 100 ft (30 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

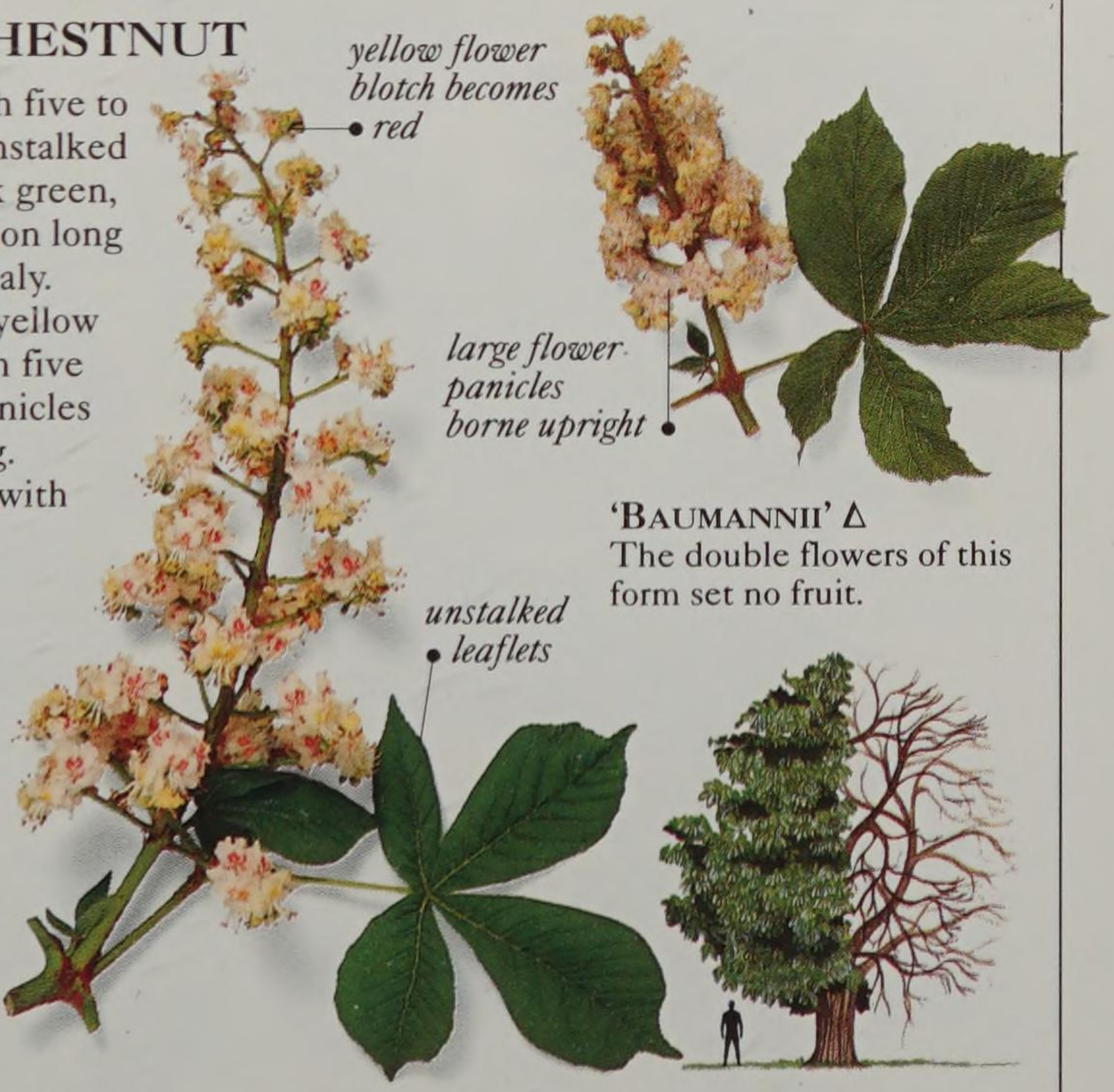
Family HIPPOCASTANACEAE	Species *Aesculus hippocastanum*	Author Linnaeus

COMMON HORSE CHESTNUT

Leaves Palmately compound, with five to seven obovate, sharply toothed, unstalked leaflets, to 12 in (30 cm) long, dark green, usually turning yellow in autumn, on long stalks. ***Bark*** Red-brown or gray, scaly. ***Flowers*** Creamy yellow blotched yellow becoming white blotched red, with five petals, in large, conical, upright panicles to 12 in (30 cm) long, in late spring. ***Fruit*** Rounded, spiny, and green, with up to three glossy brown seeds.

- **NATIVE REGION** Albania, N. Greece.
- **HABITAT** Mountain woods.
- **REMARK** The native region of this species was unknown for many years, because of its introduction to European gardens via cultivation in Turkey.

AESCULUS ▷ HIPPOCASTANUM



'BAUMANNII' △
The double flowers of this form set no fruit.

Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family HIPPOCASTANACEAE	Species *Aesculus indica*	Author (Cambessèdes) J.D. Hooker

INDIAN HORSE CHESTNUT

Leaves Palmately compound, with usually seven but occasionally five obovate to lanceolate stalked and finely toothed leaflets, to 10 in (25 cm) long, bronze when young becoming glossy green above, turning orange or yellow in autumn. ***Bark*** Gray and smooth. ***Flowers*** White to pale pink blotched bright yellow, the blotch becoming red, with long, protruding stamens, in conical, upright panicles to 12 in (30 cm) long, in midsummer. ***Fruit*** Pear-shaped, scaly, and brown, with up to three seeds, on a stout stalk.

• **NATIVE REGION** N.W. Himalayas.
• **HABITAT** Forests and shady ravines.
• **REMARK** This species flowers much later than the common horse chestnut *(Aesculus hippocastanum*, see p.179).

scaly, spineless husk encloses seeds

some leaflets narrow toward tip

some leaflets have broader shape

leaflets edged with fine teeth

small point at leaflet tip

yellow blotch turns red as flower ages

short stalk joins each leaflet to leaf stalk

Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family HIPPOCASTANACEAE	Species *Aesculus x neglecta*	Author Lindley

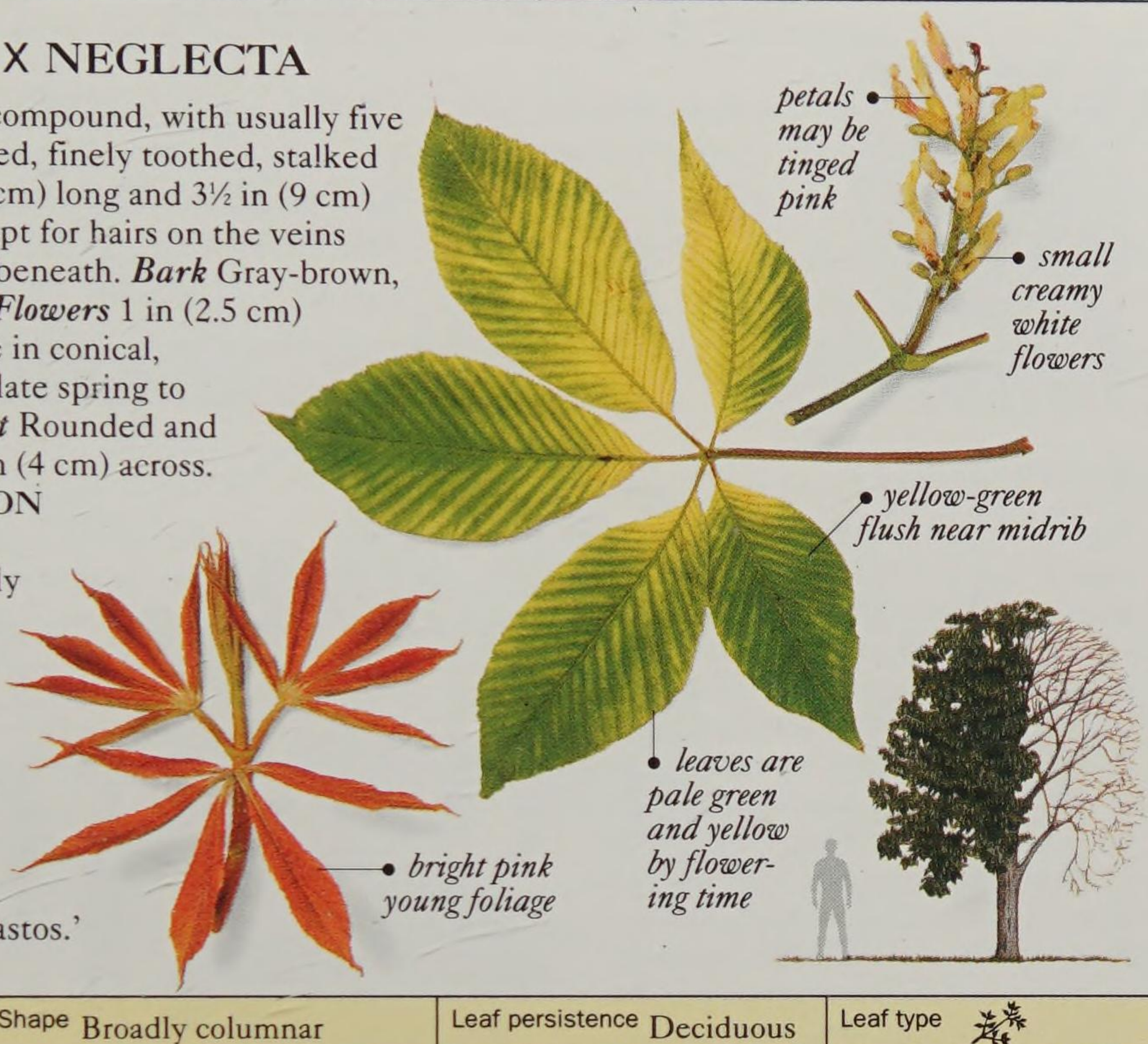
AESCULUS X NEGLECTA

Leaves Palmately compound, with usually five elliptic, taper-pointed, finely toothed, stalked leaflets, to 8 in (20 cm) long and 3½ in (9 cm) across, smooth except for hairs on the veins above, thinly hairy beneath. ***Bark*** Gray-brown, shallowly fissured. ***Flowers*** 1 in (2.5 cm) long, whitish, borne in conical, upright panicles in late spring to early summer. ***Fruit*** Rounded and smooth, about 1½ in (4 cm) across.

• **NATIVE REGION** S.E. United States.

• **HABITAT** Mainly the coastal plain.

• **REMARK** A hybrid between sweet buckeye *(Aesculus flava*, see p.179) and *Aesculus sylvatica*, most well-known for the cultivar, 'Erythroblastos.'



Height 50 ft (15 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family HIPPOCASTANACEAE	Species *Aesculus pavia*	Author Linnaeus

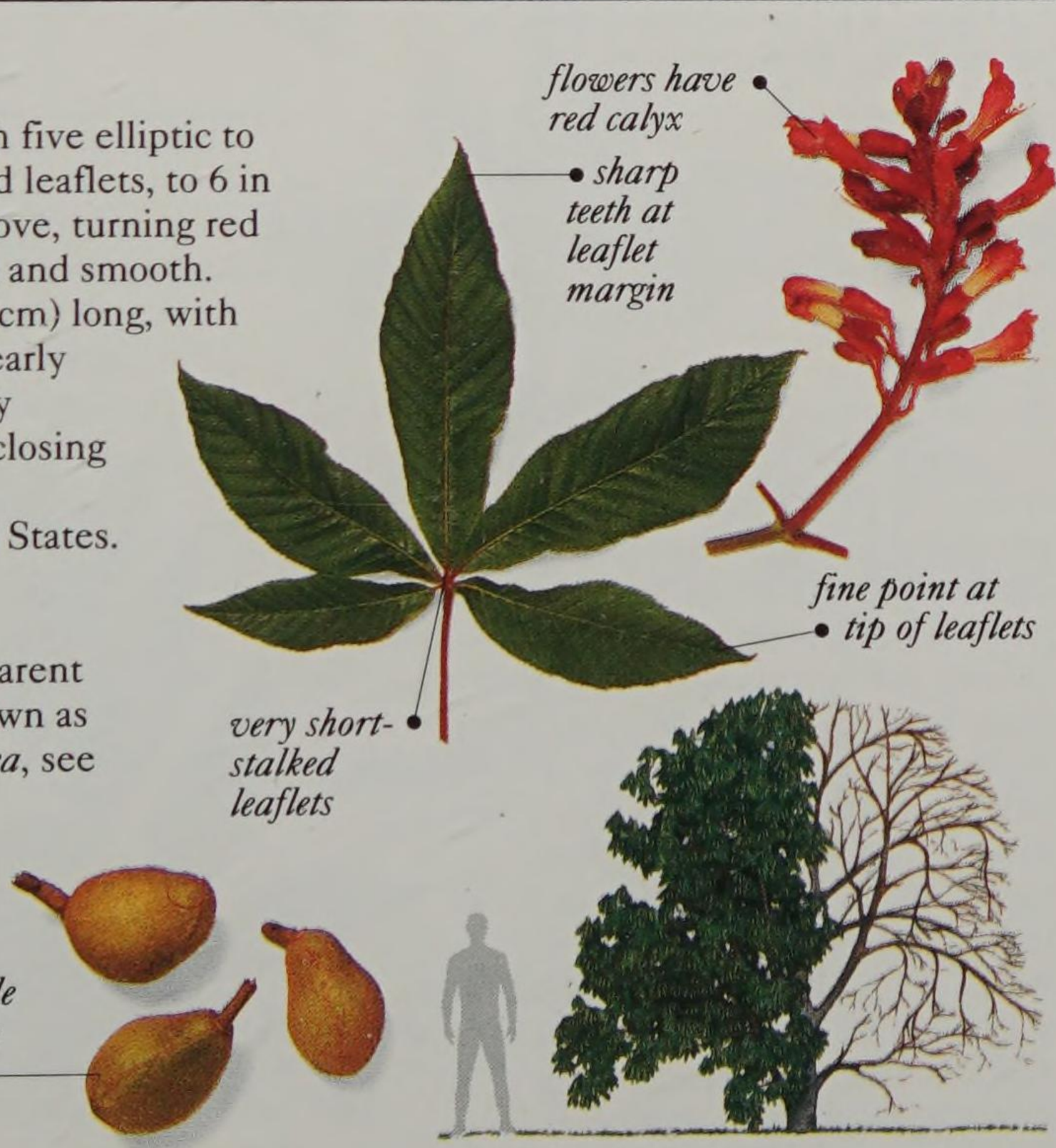
RED BUCKEYE

Leaves Palmately compound, with five elliptic to lanceolate, sharply toothed, stalked leaflets, to 6 in (15 cm) long, glossy dark green above, turning red in autumn. ***Bark*** Dark gray-brown and smooth. ***Flowers*** Slender and red, 1½ in (4 cm) long, with four petals, in upright panicles in early summer. ***Fruit*** Rounded to slightly elongated, smooth, and brown, enclosing one or two glossy brown seeds.

• **NATIVE REGION** S.E.United States.

• **HABITAT** Moist, rich woods and thickets.

• **REMARK** This species is one parent plant of the hybrid commonly known as red horse chestnut *(Aesculus* x *carnea*, see p.178). The tree has red flowers, hence its common name.



Height 17 ft (5 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

JUGLANDACEAE

MOST MEMBERS OF this family are deciduous plants. Seven genera with some 60 species grow wild in the Americas, and from southeast Europe to Japan and Southeast Asia. The leaves are usually alternate and pinnate. The small flowers lack petals and are clustered in catkins, males and females on the same plant. The fruit is either a large nut or small and winged.

Family JUGLANDACEAE	Species *Carya cordiformis*	Author (Wangenheim) K. Koch

BITTERNUT

Leaves Pinnate, with usually five to nine sharply toothed leaflets, to 6 in (15 cm) long, deep green above, turning golden yellow in autumn; winter buds with scurfy, yellow scales. ***Bark*** Gray, smooth, becoming thick, furrowed, and ridged. ***Flowers*** Small, without petals, clustered in catkins, male catkins with three hanging branches to 3 in (7.5 cm) long, females inconspicuous, separately on the same plant in late spring to early summer. ***Fruit*** A thin-shelled, bitter, inedible, gray nut, enclosed in a green husk, to 1½ in (4 cm) long, with four wings.

• **NATIVE REGION**
E. North America.

• **HABITAT** Deciduous forests, in swamps, and on riverbanks.

Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family JUGLANDACEAE	Species *Carya illinoensis*	Author (Wangenheim) K. Koch

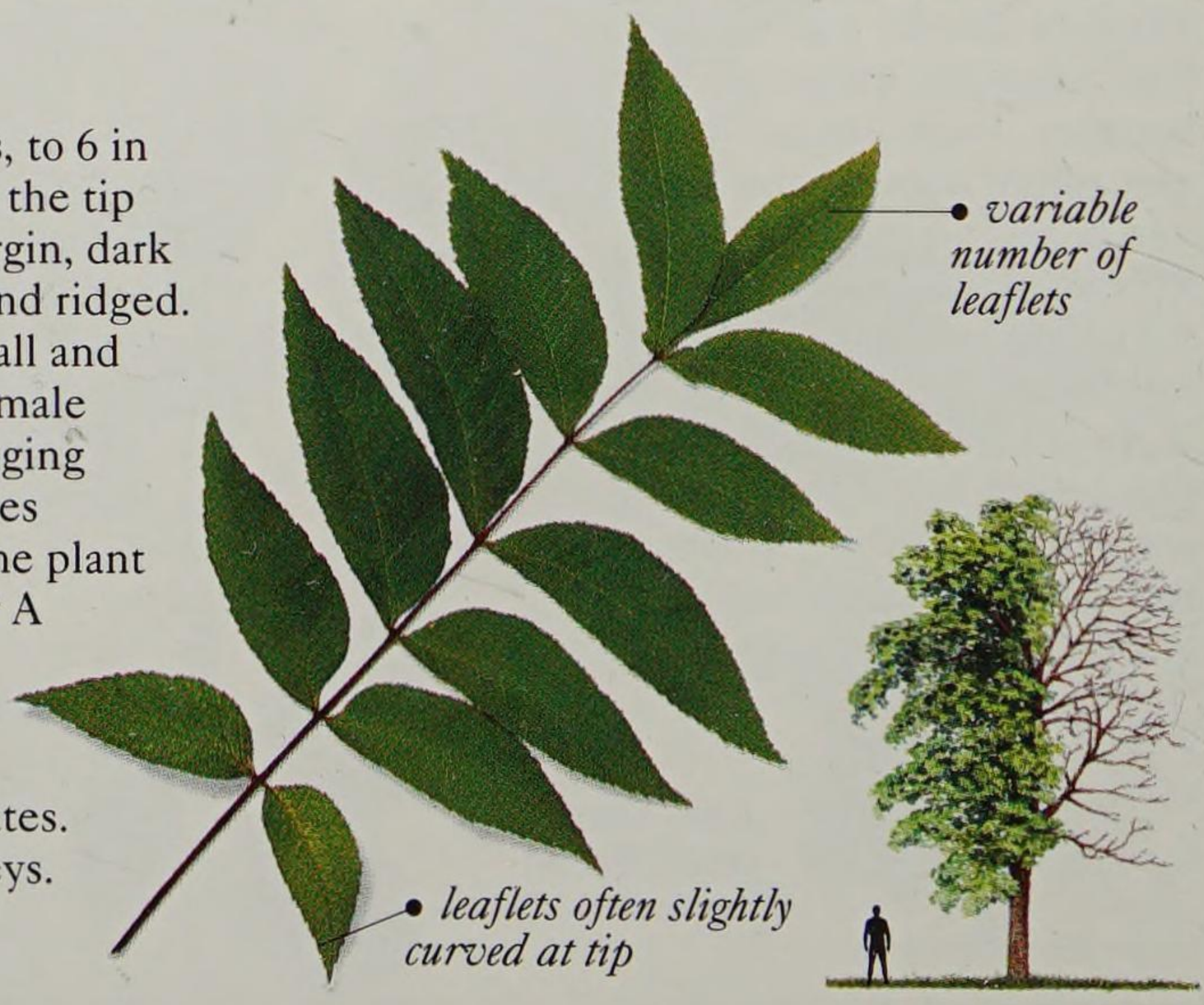
PECAN

Leaves Pinnate, with 9 to 17 leaflets, to 6 in (15 cm) long, slender, taper-pointed, the tip curved backward, toothed at the margin, dark green. ***Bark*** Gray, thick, furrowed, and ridged. ***Flowers*** Males and females both small and without petals, clustered in catkins, male catkins yellow-green, with three hanging branches to 3 in (7.5 cm) long, females inconspicuous, separately on the same plant in late spring to early summer. ***Fruit*** A thin-shelled, sweet, edible, red-brown nut, in a green husk, to 2½ in (6 cm) long, with four wings.

• **NATIVE REGION** S. United States.

• **HABITAT** Moist forests and valleys.

• **REMARK** The nuts have an important commercial value.



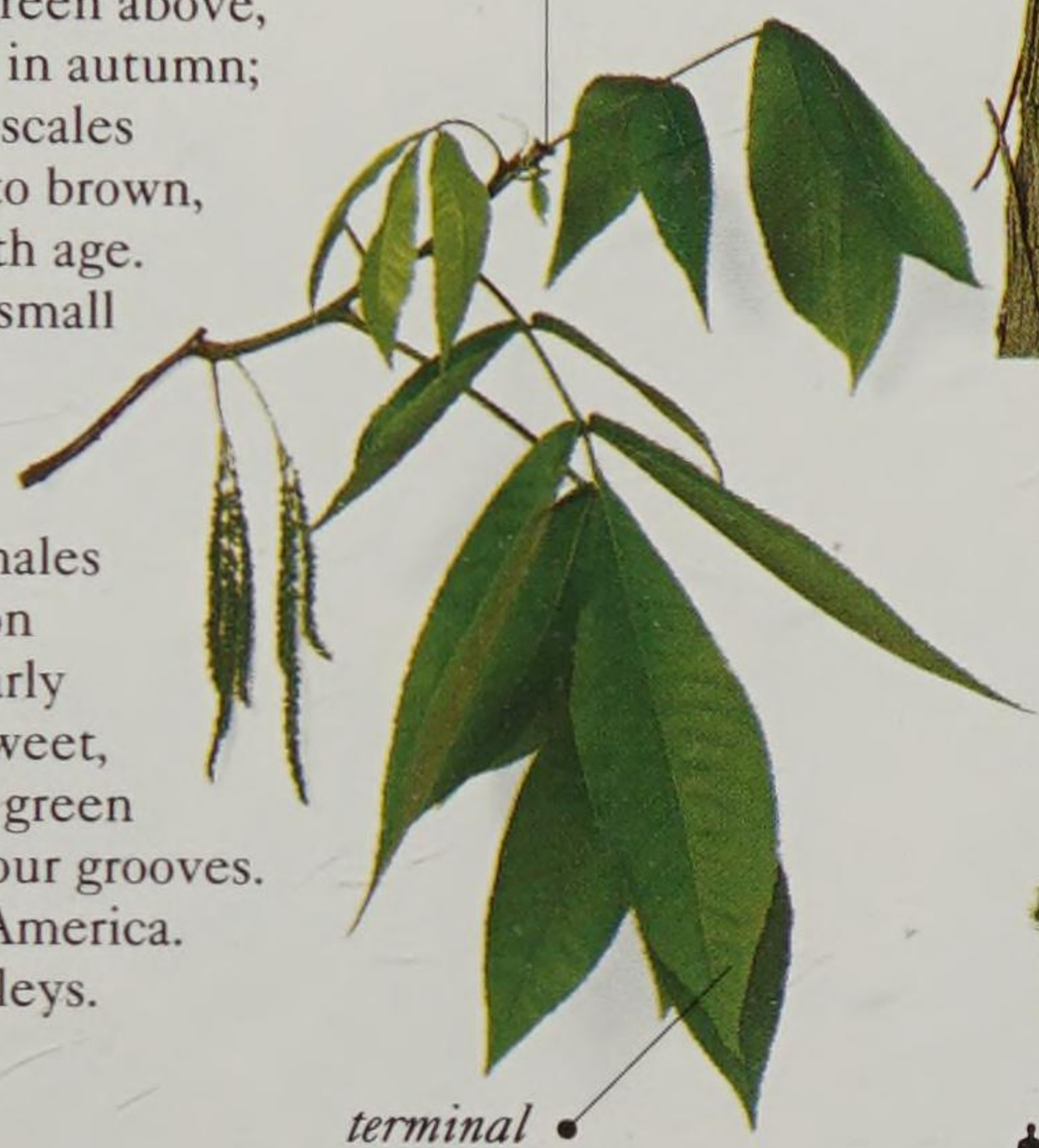
Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family JUGLANDACEAE	Species *Carya ovata*	Author (Miller) K. Koch

SHAGBARK HICKORY

Leaves Pinnate, with usually five taper-pointed leaflets, to 8 in (12 cm) long, toothed except at the base, deep yellow-green above, turning golden yellow and brown in autumn; winter buds with dark scales, the scales spreading at the tips. ***Bark*** Gray to brown, peeling in long, vertical plates with age. ***Flowers*** Males and females both small and without petals, clustered in catkins, male catkins yellow-green, with three hanging branches to 5 in (13 cm) long, females inconspicuous, borne separately on the same plant in late spring to early summer. ***Fruit*** A thick-shelled, sweet, edible, whitish nut, enclosed in a green husk, to 2½ in (6 cm) long, with four grooves.

- **NATIVE REGION** E. North America.
- **HABITAT** Rich woods and valleys.
- **REMARK** The distinctively peeling bark gives this species its common name.



Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family JUGLANDACEAE	Species *Juglans ailantifolia*	Author Carrière

JAPANESE WALNUT

Leaves Pinnate, with 11 to 17 short-pointed, toothed leaflets, to 6 in (15 cm) long, dark green above, hairy on both sides, particularly so beneath, borne on stout, sticky, hairy shoots. ***Bark*** Gray-brown, fissured and separating into small plates with age. ***Flowers*** Males and females small and without petals, clustered in catkins, male catkins greenish, to 12 in (30 cm) long, hanging, on the old shoots, female catkins to 4 in (10 cm) long, with red stigmas, at the end of the young shoots, borne separately on the same plant in late spring to early summer. ***Fruit*** A shallowly pitted, brown nut, enclosed in a sticky, green husk, to 2 in (5 cm) long, in clusters of up to 20.

- **NATIVE REGION** Japan.
- **HABITAT** Wet areas and by streams.
- **REMARK** The fruit husk is poisonous. In Japan, it is traditionally used to catch fish. The nuts are also eaten, and the wood is used for building and other purposes.

Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family JUGLANDACEAE	Species *Juglans cinerea*	Author Linnaeus

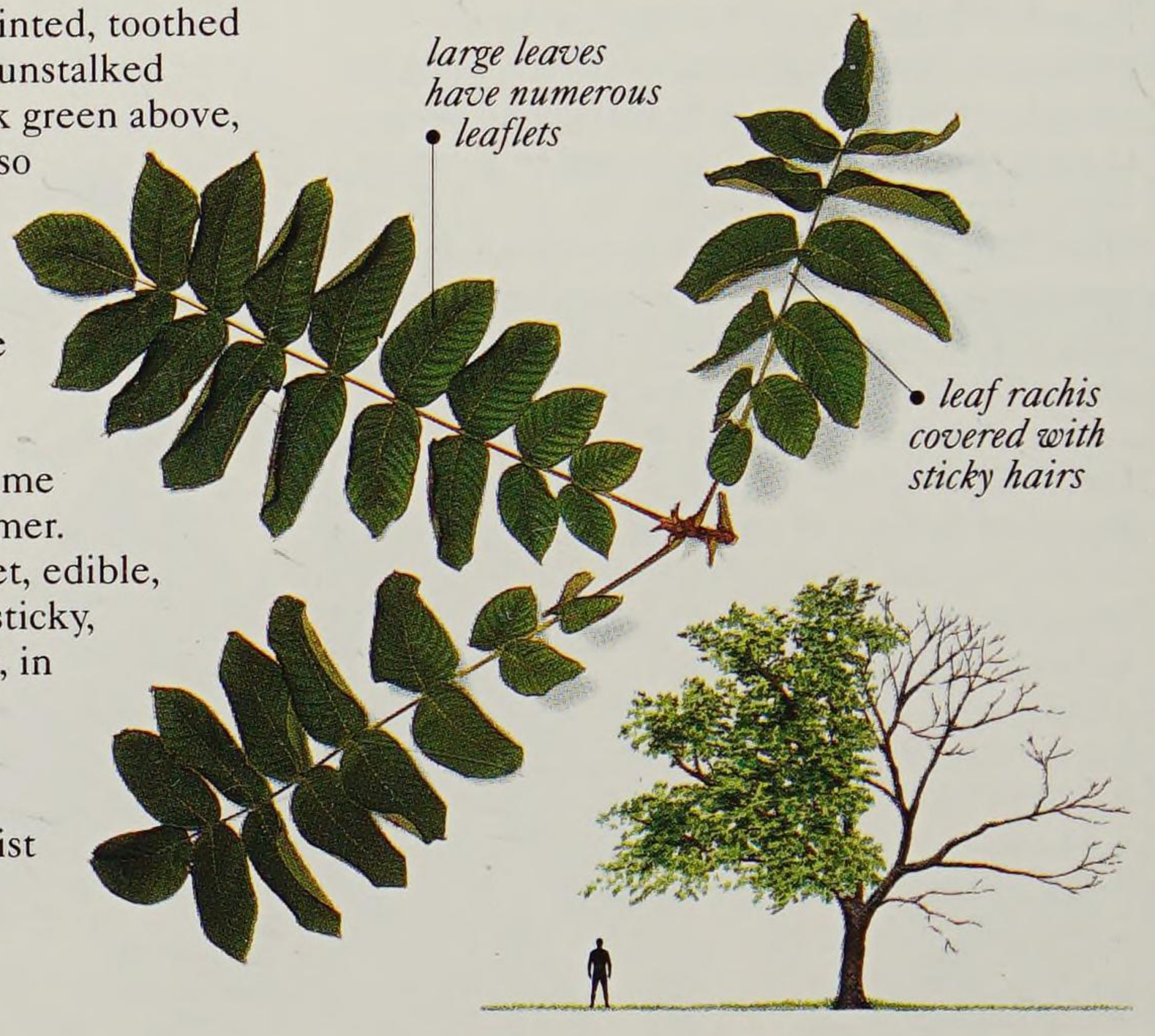
BUTTERNUT

Leaves Pinnate, with 7 to 17 pointed, toothed leaflets, to 5 in (13 cm) long, all unstalked except for the terminal one, dark green above, hairy on both sides, particularly so beneath. ***Bark*** Gray, furrowed, ridged. ***Flowers*** Males and females both small and without petals, clustered in catkins, male catkins greenish, to 4 in (10 cm) long, hanging, female catkins short, borne separately on the same plant in late spring to early summer. ***Fruit*** An elongated, rough, sweet, edible, oily nut, enclosed in a pointed, sticky, green husk, to 2½ in (6 cm) long, in clusters of up to five.

• **NATIVE REGION**
E. North America.

• **HABITAT** Rich woods or moist soil in valleys and on slopes.

• **REMARK** Also known as white walnut.



Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family JUGLANDACEAE	Species *Juglans nigra*	Author Linnaeus

BLACK WALNUT

Leaves Pinnate, with 11 to 17 or more slender, taper-pointed, sharply toothed leaflets, to 4¾ in (12 cm) long, glossy dark green above, hairy at least beneath, aromatic. ***Bark*** Dark gray-brown to blackish, with narrow, rough ridges. ***Flowers*** Males and females both small and without petals, clustered in catkins, male catkins yellow-green, to 4 in (10 cm) long, hanging, female catkins short, borne separately on the same plant in late spring to early summer. ***Fruit*** A rounded, edible, brown nut, enclosed in a green husk, to 2 in (5 cm) long, borne singly or in pairs.

• **NATIVE REGION**
C. and E. United States.

• **HABITAT** Rich woods.

• **REMARK** Both the wood and the nuts are valuable commodities.

Height 100 ft (30 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

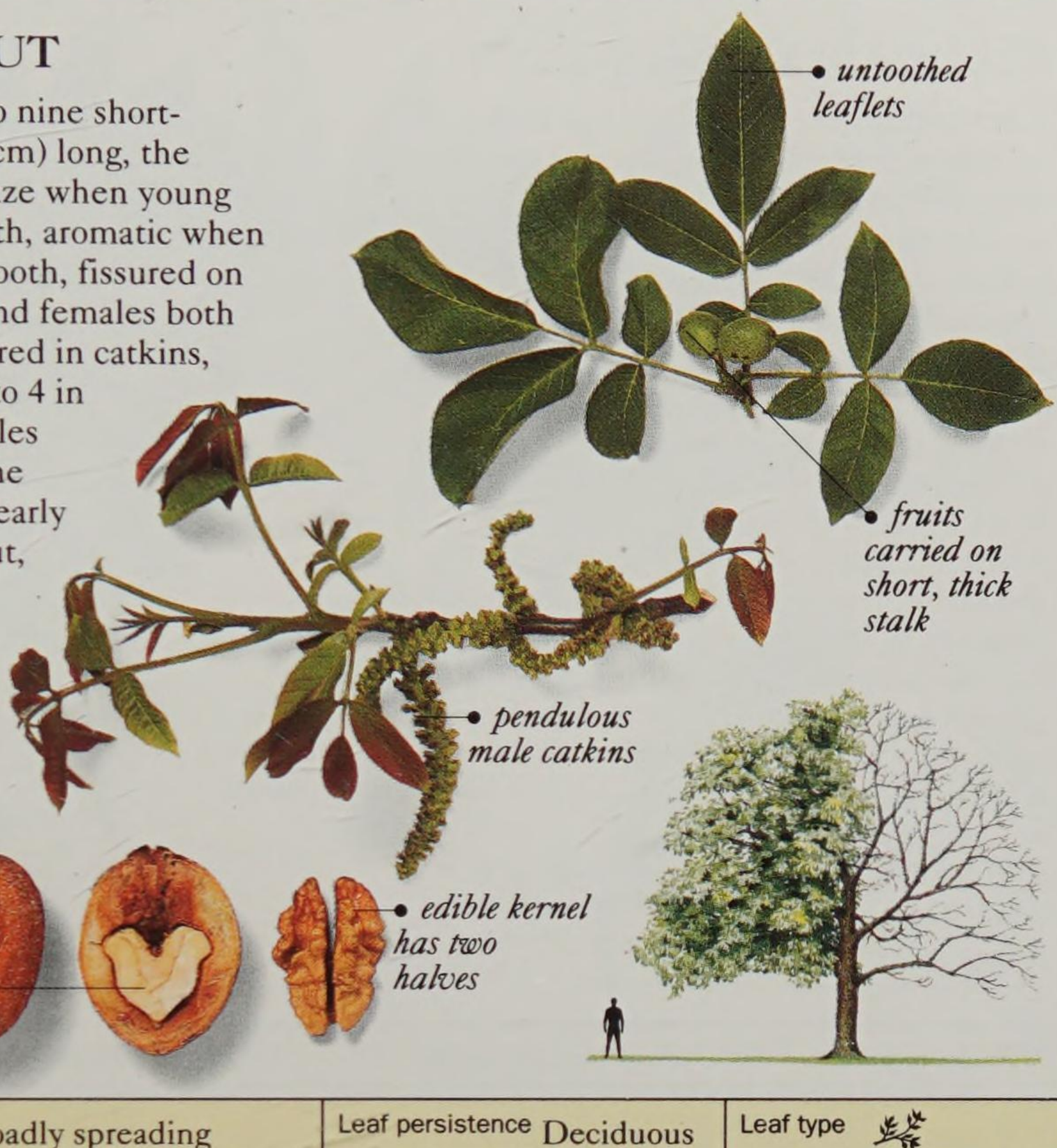
Family JUGLANDACEAE	Species *Juglans regia*	Author Linnaeus

ENGLISH WALNUT

Leaves Pinnate, with five to nine short-pointed leaflets, to 6 in (15 cm) long, the terminal leaflet largest, bronze when young becoming dark green, smooth, aromatic when bruised. ***Bark*** Pale gray, smooth, fissured on old plants. ***Flowers*** Males and females both small, without petals, clustered in catkins, male catkins yellow-green, to 4 in (10 cm) long, hanging, females short, borne separately on the same plant in late spring to early summer. ***Fruit*** An edible nut, creamy white becoming brown, enclosed in a green husk, to 2 in (5 cm) long.

• **NATIVE REGION** China to S.E. Europe.

• **HABITAT** Valleys and streambanks.



Height 100 ft (30 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family JUGLANDACEAE	Species *Platycarya strobilacea*	Author Siebold & Zuccarini

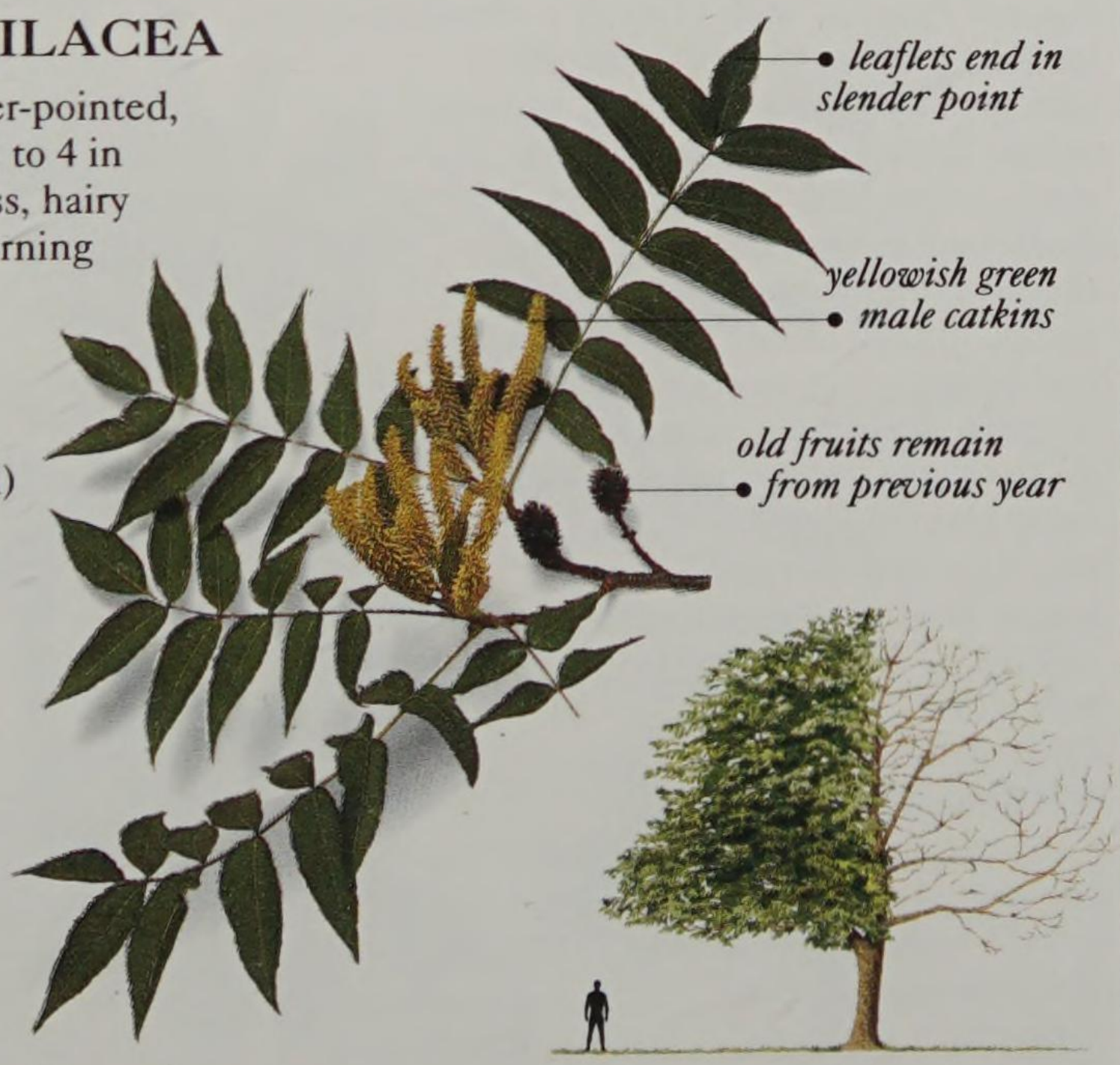
PLATYCARYA STROBILACEA

Leaves Pinnate, with up to 15 taper-pointed, sharply toothed, unstalked leaflets, to 4 in (10 cm) long and 1¼ in (3 cm) across, hairy becoming smooth on both sides, turning yellow in autumn. ***Bark*** Yellow-brown, with vertical fissures. ***Flowers*** Males and females both small, without petals, in upright catkins, male catkins to 4 in (10 cm) long, clustered together around a single, green female catkin, borne separately on the same plant in summer. ***Fruit*** Conelike, brown, 1½ in (4 cm) long, long-persistent.

• **NATIVE REGION** E. Asia.

• **HABITAT** Forests in dry, sunny situations.

• **REMARK** An unusual relative of the wingnuts *(Pterocarya*, see pp.186–187), easily distinguished by its conelike fruit clusters.



Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family JUGLANDACEAE	Species *Pterocarya fraxinifolia*	Author (Lamarck) Spach

CAUCASIAN WINGNUT

Leaves Pinnate, with 11 to 23 or more toothed, unstalked leaflets, to 6 in (15 cm) long and 1½ in (4 cm) across, glossy dark green and smooth above, turning yellow in autumn, carried on an unwinged rachis; leaf buds covered in brown hairs during winter. ***Bark*** Whitish-gray, smooth, becoming furrowed with age. ***Flowers*** Small and without petals, with pink stigmas, in green, pendulous catkins, males stout, to 4¾ in (12 cm) long, females slender, to 6 in (15 cm) long, borne separately on the same plant in spring; flower stigmas elongate as fruits ripen. ***Fruit*** A small nut, surrounded by two semi-circular, green wings, borne in slender, hanging catkins, to 20 in (50 cm) long.

• **NATIVE REGION**
E. Caucasus, N. Iran.

• **HABITAT** Woods, near rivers, and in boggy places.

Height 100 ft (30 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

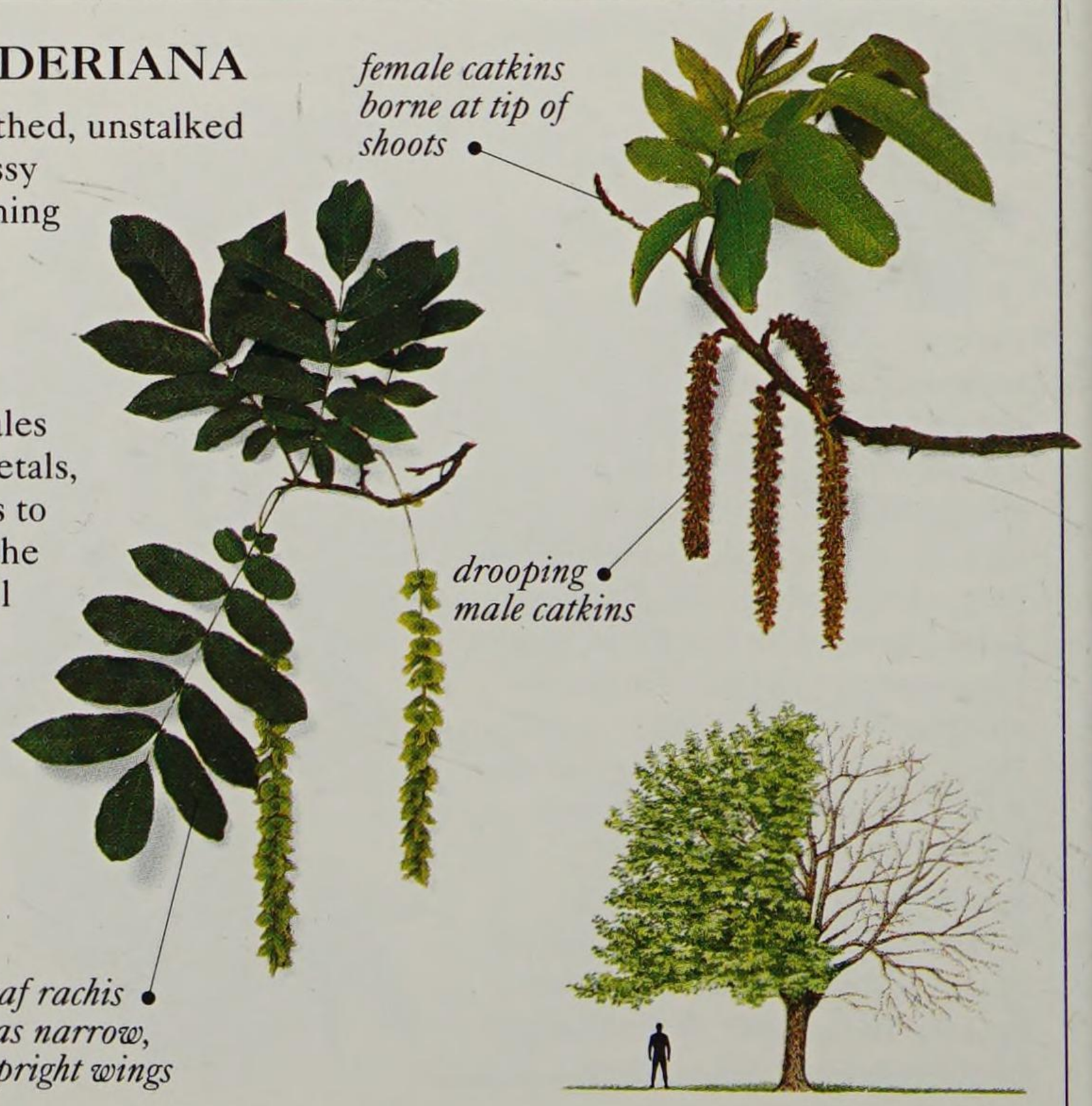
Family JUGLANDACEAE	Species *Pterocarya* x *rehderiana*	Author Schneider

PTEROCARYA X REHDERIANA

Leaves Pinnate, with 11 to 21 toothed, unstalked leaflets, to 4¾ in (12 cm) long, glossy dark green and smooth above, turning yellow in autumn, the rachis with small, untoothed, upright wings. ***Bark*** Purple-brown, cracked into diagonal, interlacing ridges; pale orange in the fissures. ***Flowers*** Males and females both small, without petals, in green, pendulous catkins, males to 4¾ in (12 cm) long, separately on the same plant in spring. ***Fruit*** A small nut, with two elongated, green wings, borne in slender, hanging catkins, to 18 in (45 cm) long.

• **NATIVE REGION**
Of garden origin.

• **REMARK** A hybrid between Caucasian wingnut *(P. fraxinifolia*, see above) and *P. stenoptera* (see p.187), raised at the Arnold Arboretum of Harvard University, Boston.



Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family JUGLANDACEAE	Species *Pterocarya rhoifolia*	Author Siebold & Zuccarini

JAPANESE WINGNUT

Leaves Pinnate, with 11 to 21 taper-pointed, toothed, unstalked leaflets, to 4¾ in (12 cm) long, glossy green above, turning yellow in autumn, carried on an unwinged rachis; leaf buds covered with scales in winter. ***Bark*** Dark gray, becoming vertically fissured with age. ***Flowers*** Males and females small and without petals, in green, pendulous catkins, males to 3 in (7.5 cm) long, at the base of the young shoots, females at tip, separately on the same plant in spring. ***Fruit*** A small nut, with green wings, in clusters on slender, hanging catkins, to 12 in (30 cm) long.

- **NATIVE REGION** Japan.
- **HABITAT** Near mountain streams.
- **REMARK** In winter, it is easily distinguished by the scaly leaf buds.

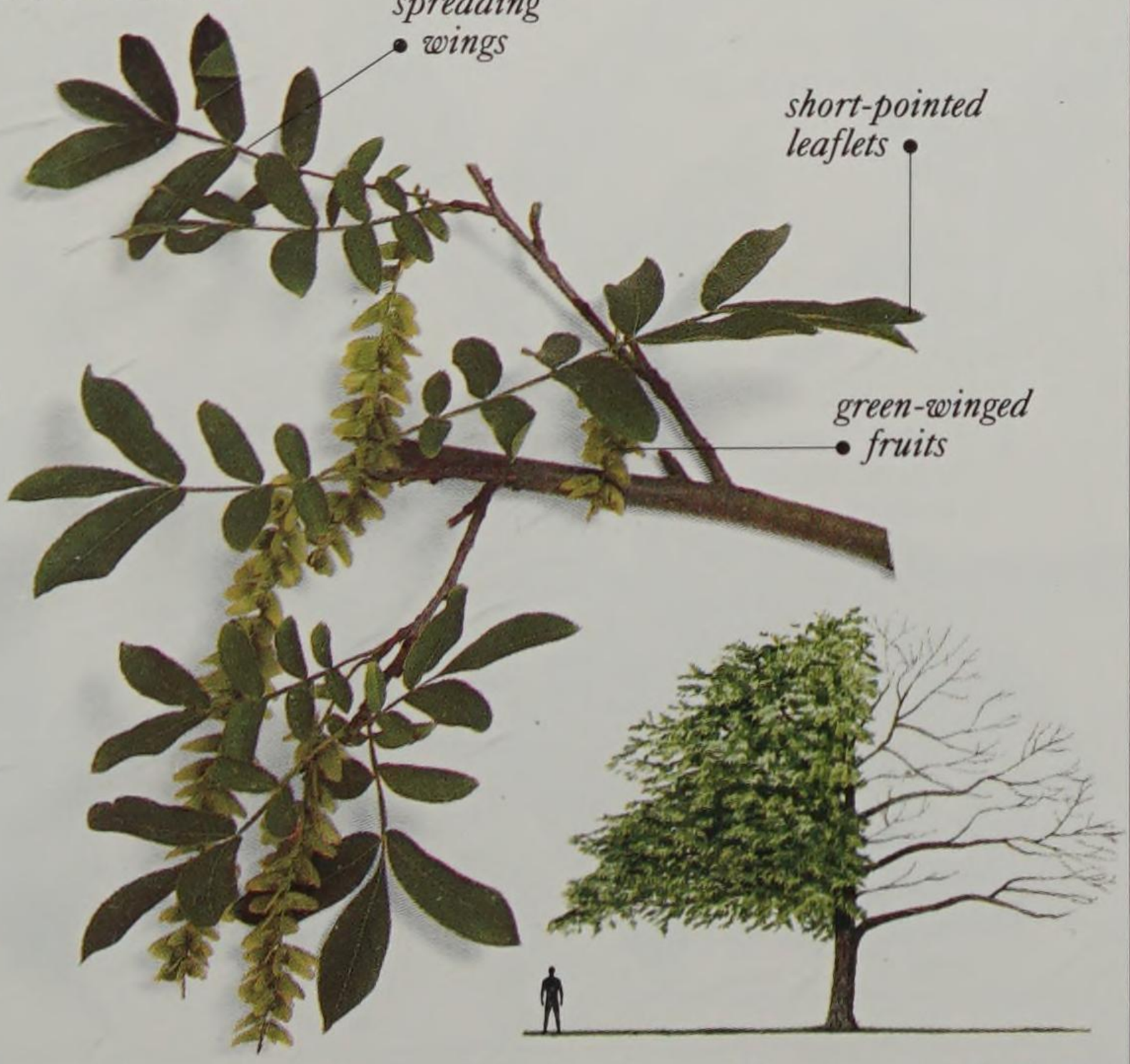
Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family JUGLANDACEAE	Species *Pterocarya stenoptera*	Author C. de Candolle

PTEROCARYA STENOPTERA

Leaves Pinnate, with 11 to 21 toothed, unstalked leaflets, bright green and smooth above, turning yellow in autumn, the rachis with narrow, often toothed, wings. ***Bark*** Gray-brown, with deep fissures. ***Flowers*** Males and females both small and without petals, in separate, green, pendulous catkins, males to 2½ in (6 cm) long, on the same plant in spring. ***Fruit*** A small nut, with two narrow wings, in clusters on slender, hanging catkins, to 12 in (30 cm) long.

- **NATIVE REGION** China.
- **HABITAT** Moist woods and streambanks.
- **REMARK** This species is easily distinguished by the characteristically angled wings on the leaf rachis.



Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

LAURACEAE

SOME 40 GENERA and more than 2,000 species belong to this widespread family; many grow wild in tropical South America and Southeast Asia. These deciduous and evergreen, usually aromatic trees and shrubs have either opposite, or alternate untoothed leaves. Flower petals and sepals, which resemble each other, are arranged in threes. The fruit is usually fleshy.

Family LAURACEAE	Species *Laurus nobilis*	Author Linnaeus

BAY LAUREL

Leaves Elliptic to ovate, to 4 in (10 cm) long and 1½ in (4 cm) across, pointed at the tip, with a wavy margin, glossy dark green above, paler beneath, smooth, leathery, aromatic when crushed.
Bark Dark gray, smooth.
Flowers About ⅜ in (1 cm) across, yellow-green, males with numerous yellow stamens, in clusters in the leaf axils, on separate plants in spring.
Fruit A rounded berry, about ⅜ in (1 cm) long, green ripening to black.

• **NATIVE REGION** Mediterranean.
• **HABITAT** Evergreen woods, thickets and rocky places.
• **REMARK** Also known as sweet bay. This species and the related Canary Island laurel *(Laurus azorica)* are the only members of the family native to Europe.

Height 50 ft (15 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family LAURACEAE	Species *Sassafras albidum*	Author (Nuttall) Nees

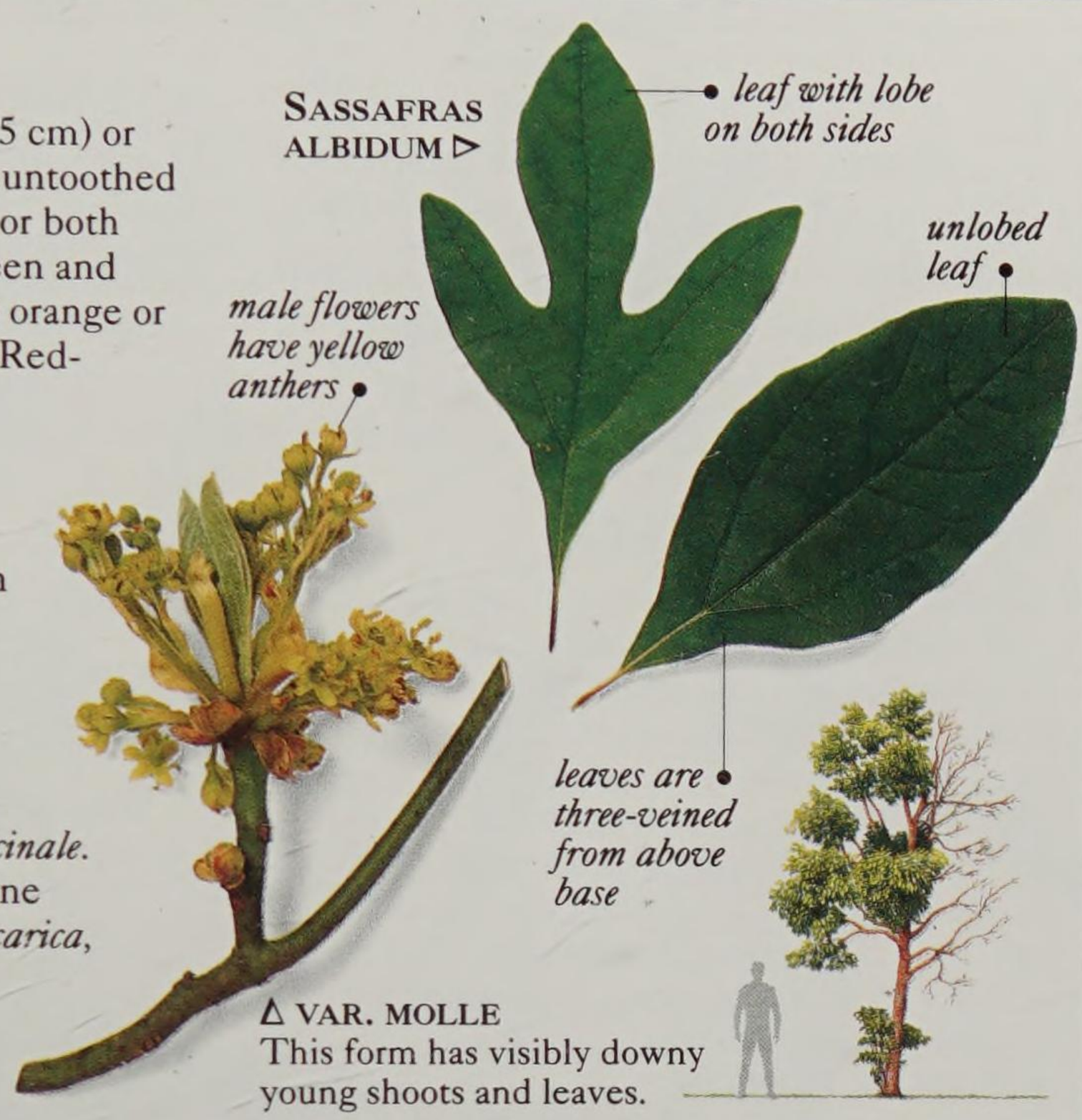
SASSAFRAS

Leaves Elliptic to ovate, to 6 in (15 cm) or more long and 4 in (10 cm) across, untoothed but sometimes with a lobe on one or both sides, bright green above, blue-green and smooth beneath, turning yellow to orange or purple in autumn, aromatic. ***Bark*** Red-brown, thick, furrowed, aromatic. ***Flowers*** Males and females very small, yellow or greenish yellow, without petals, in small clusters or short racemes on separate plants in spring. ***Fruit*** An egg-shaped deep blue berry, ⅜ in (1 cm) long.

• **NATIVE REGION**
E. North America.

• **HABITAT** Woods and thickets.

• **REMARK** Also known as *S. officinale*. Leaves may appear similar in outline to those of the common fig *(Ficus carica*, see p.219). The root bark is traditionally used to make tea and root beer.



Δ VAR. MOLLE
This form has visibly downy young shoots and leaves.

Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family LAURACEAE	Species *Umbellularia californica*	Author (W.J. Hooker & Arnott) Nuttall

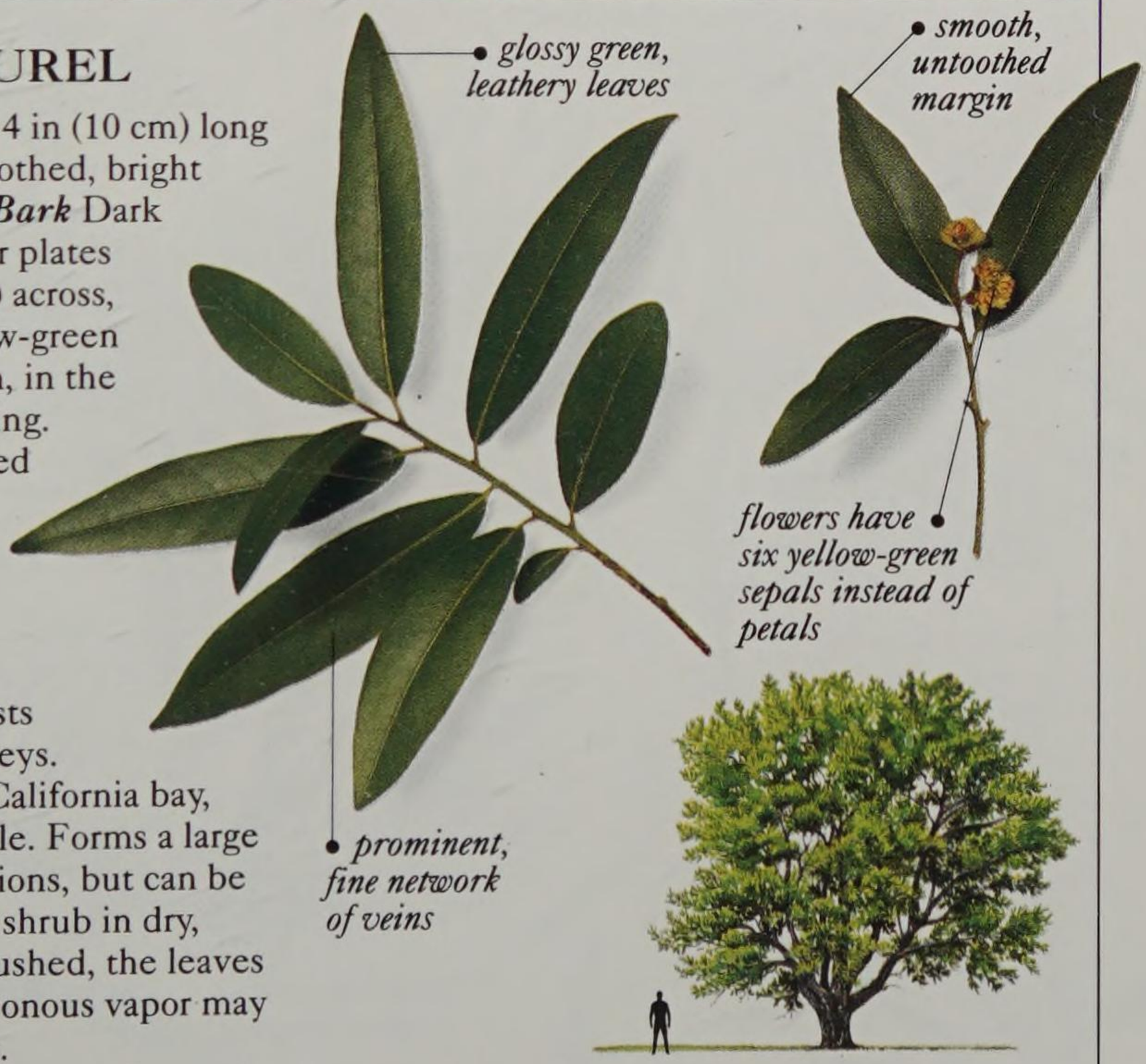
CALIFORNIA LAUREL

Leaves Elliptic to oblong, to 4 in (10 cm) long and 1 in (2.5 cm) across, untoothed, bright green or deep yellow-green. ***Bark*** Dark gray, cracking into rectangular plates with age. ***Flowers*** ⅜ in (1 cm) across, without petals, with six yellow-green sepals, in clusters of up to ten, in the leaf axils in late winter to spring. ***Fruit*** A rounded to egg-shaped berry, about 1 in (2.5 cm) long, green ripening to deep purple.

• **NATIVE REGION**
S.W. Oregon, California.

• **HABITAT** Evergreen forests and scrub in canyons and valleys.

• **REMARK** Also known as California bay, California olive, Oregon myrtle. Forms a large tree in moist, sheltered situations, but can be reduced to the size of a small shrub in dry, exposed conditions. When crushed, the leaves emit an acrid smell. This poisonous vapor may induce nausea and headaches.



Height 100 ft (30 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

LEGUMINOSAE

THE PEA FAMILY contains about 700 genera and over 15,000 species of trees, shrubs, and herbaceous plants, found worldwide. The leaves are often compound, and frequently pinnate or with three leaflets. Species that grow in cool temperate regions have pealike flowers. The fruit, usually a pod, splits open along both sides or breaks into portions to release its seeds.

Family LEGUMINOSAE	Species *Acacia dealbata*	Author Link

SILVER WATTLE

Leaves Bipinnate, to 4¾ in (12 cm) long, with numerous linear leaflets, to 3/16 in (5 mm) long, the leaflets untoothed, blue-green, and finely hairy. ***Bark*** Smooth and green or blue-green, becoming nearly black with age. ***Flowers*** Very small, with bright yellow petals and numerous conspicuous stamens, fragrant, in panicles of small, rounded clusters in late winter to early spring. ***Fruit*** A flattened pod, to 3 in (7.5 cm) long, green becoming blue-white ripening to brown.

• **NATIVE REGION**
S.E. Australia, Tasmania.

• **HABITAT** Mainly mountain gullies and streambanks.

Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

ACACIA FALCIFORMIS ▷
Commonly known as pale hickory wattle, this species is found in southeast Australia. The leaves are undivided. In spring, small, rounded heads of yellow flowers appear in large clusters.

flower stalks covered in yellow hairs

leaves end in fine point

rounded heads of deep yellow flowers

small gland at leaf base

◁ ACACIA GLAUCOPTERA
The leaves of this western Australian species are arranged in one plane, forming a blue-green wing along the stem.

strongly scented flowers

◁ ACACIA MEARNSII
This species, commonly known as black wattle, grows wild throughout east and south Australia.

narrowly ridged shoots

bipinnate juvenile leaves

undivided adult leaves

ACACIA MELANOXYLON ▷
All acacia species with usually undivided leaves produce compound leaves in seedlings, which give way to adult foliage as the plants age. The intermediate leaves of blackwood illustrate the transition between the two different types of foliage.

intermediate leaves

Family LEGUMINOSAE	Species *Albizia julibrissin*	Author (Willdenow) Durazzini

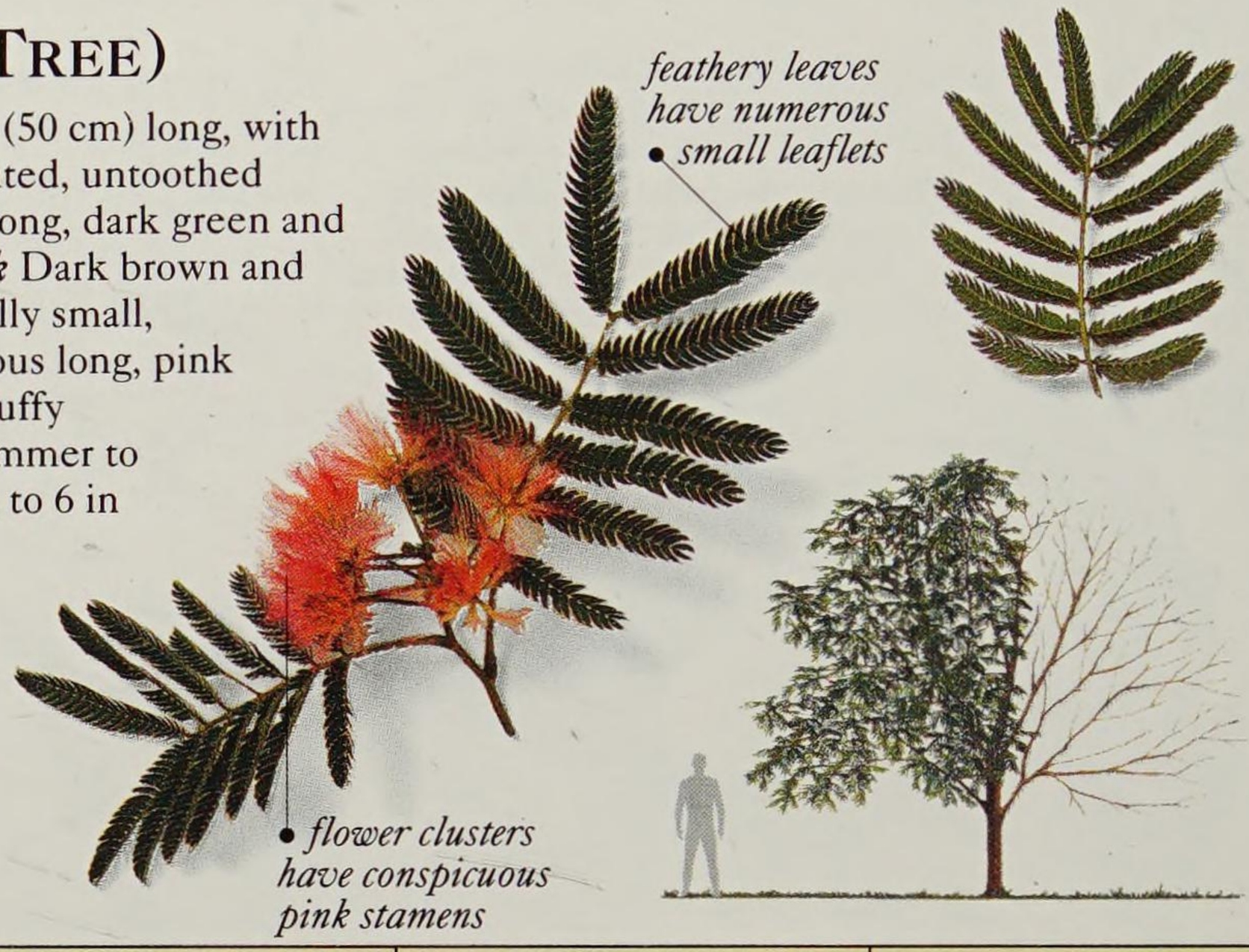
MIMOSA (SILK TREE)

Leaves Bipinnate, to 20 in (50 cm) long, with numerous small, taper-pointed, untoothed leaflets, about ⅜ in (1 cm) long, dark green and smooth on both sides. ***Bark*** Dark brown and smooth. ***Flowers*** Individually small, conspicuous by the numerous long, pink stamens, borne in dense, fluffy clusters, opening in late summer to early autumn. ***Fruit*** A pod, to 6 in (15 cm) long.

• **NATIVE REGION**
S.W. Asia.

• **HABITAT** Woods and river banks.

• **REMARK** Also known as Persian acacia, pink siris, silk tree.



Height 40 ft (12 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

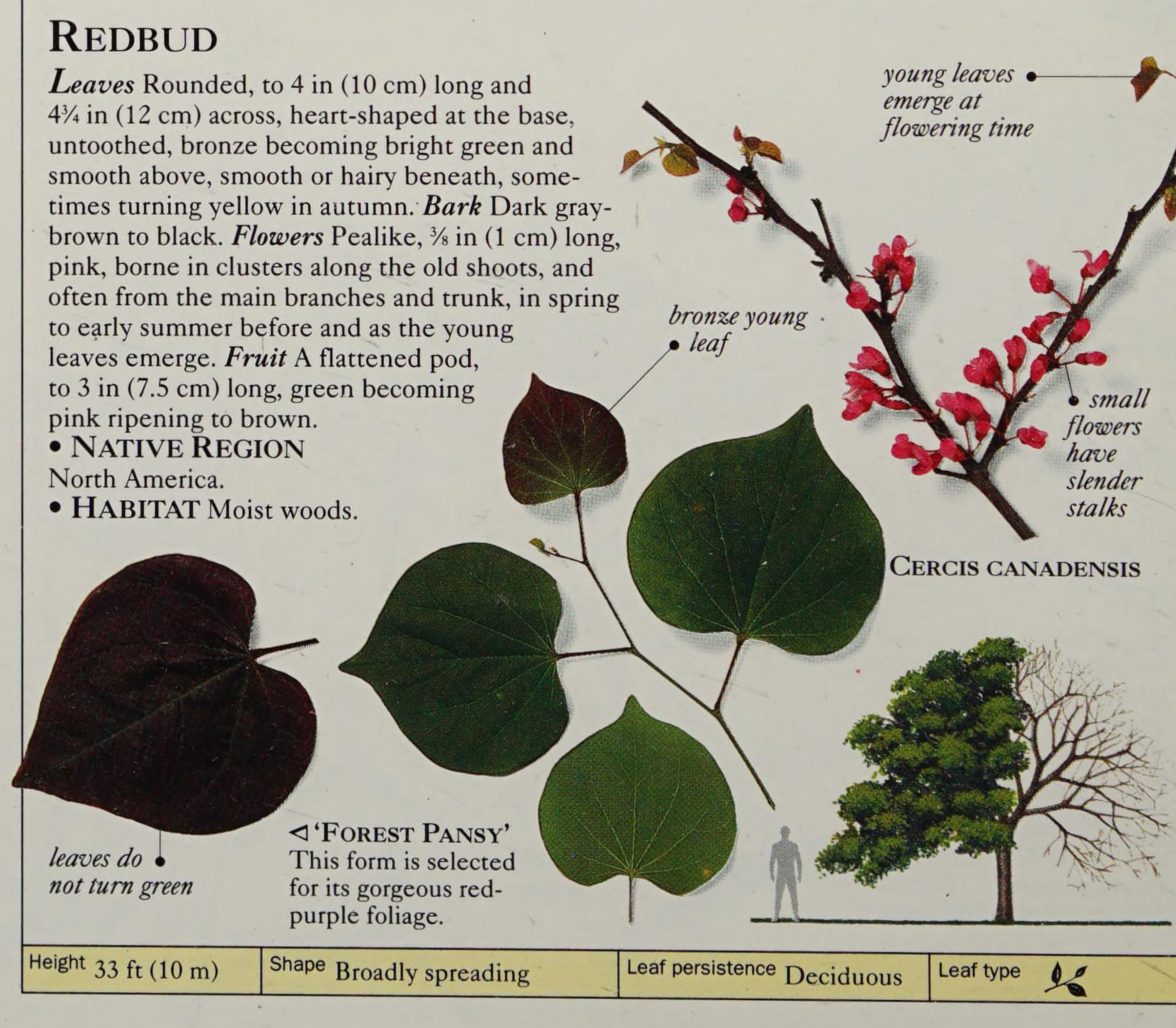
Family LEGUMINOSAE	Species *Cercis canadensis*	Author Linnaeus

REDBUD

Leaves Rounded, to 4 in (10 cm) long and 4¾ in (12 cm) across, heart-shaped at the base, untoothed, bronze becoming bright green and smooth above, smooth or hairy beneath, sometimes turning yellow in autumn. ***Bark*** Dark gray-brown to black. ***Flowers*** Pealike, ⅜ in (1 cm) long, pink, borne in clusters along the old shoots, and often from the main branches and trunk, in spring to early summer before and as the young leaves emerge. ***Fruit*** A flattened pod, to 3 in (7.5 cm) long, green becoming pink ripening to brown.

• **NATIVE REGION**
North America.

• **HABITAT** Moist woods.



◁ **'FOREST PANSY'** This form is selected for its gorgeous red-purple foliage.

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family LEGUMINOSAE	Species *Cercis racemosa*	Author Oliver

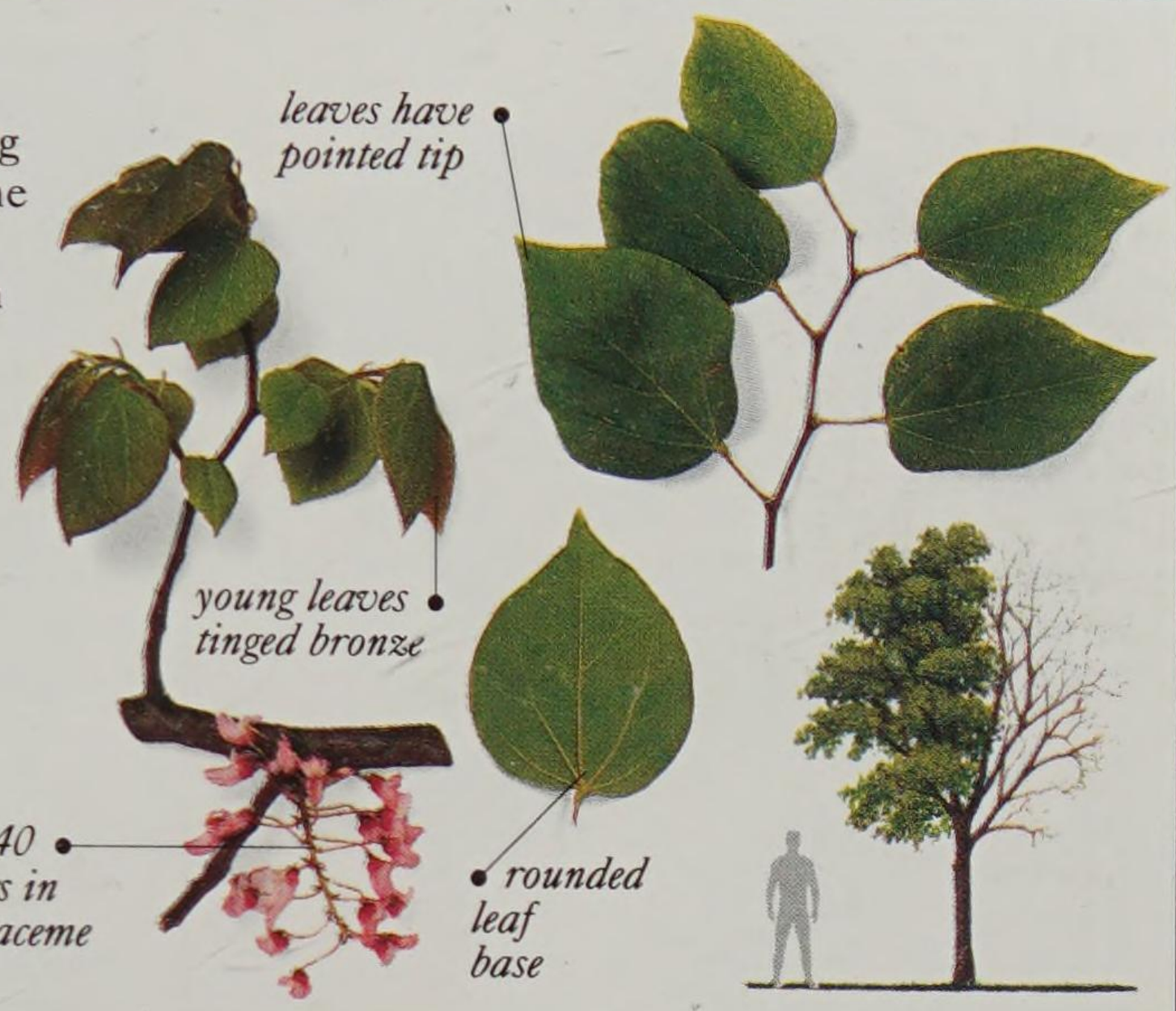
CERCIS RACEMOSA

Leaves Rounded, to 5 in (13 cm) long and 4 in (10 cm) across, rounded at the base, dark green above, hairy beneath. ***Bark*** Pale gray, flaking with age. ***Flowers*** Pealike, ⅜ in (1 cm) long, pale pink, borne in racemes from the old shoots in mid- to late spring or early summer. ***Fruit*** A flattened pod, to 4 in (10 cm) long, green becoming pink-tinged ripening to brown.

• **NATIVE REGION** China.

• **HABITAT** Woods and streambanks in mountains.

• **REMARK** A rarely seen species, distinguished by its flowers borne in racemes.



Height 33 ft (10 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

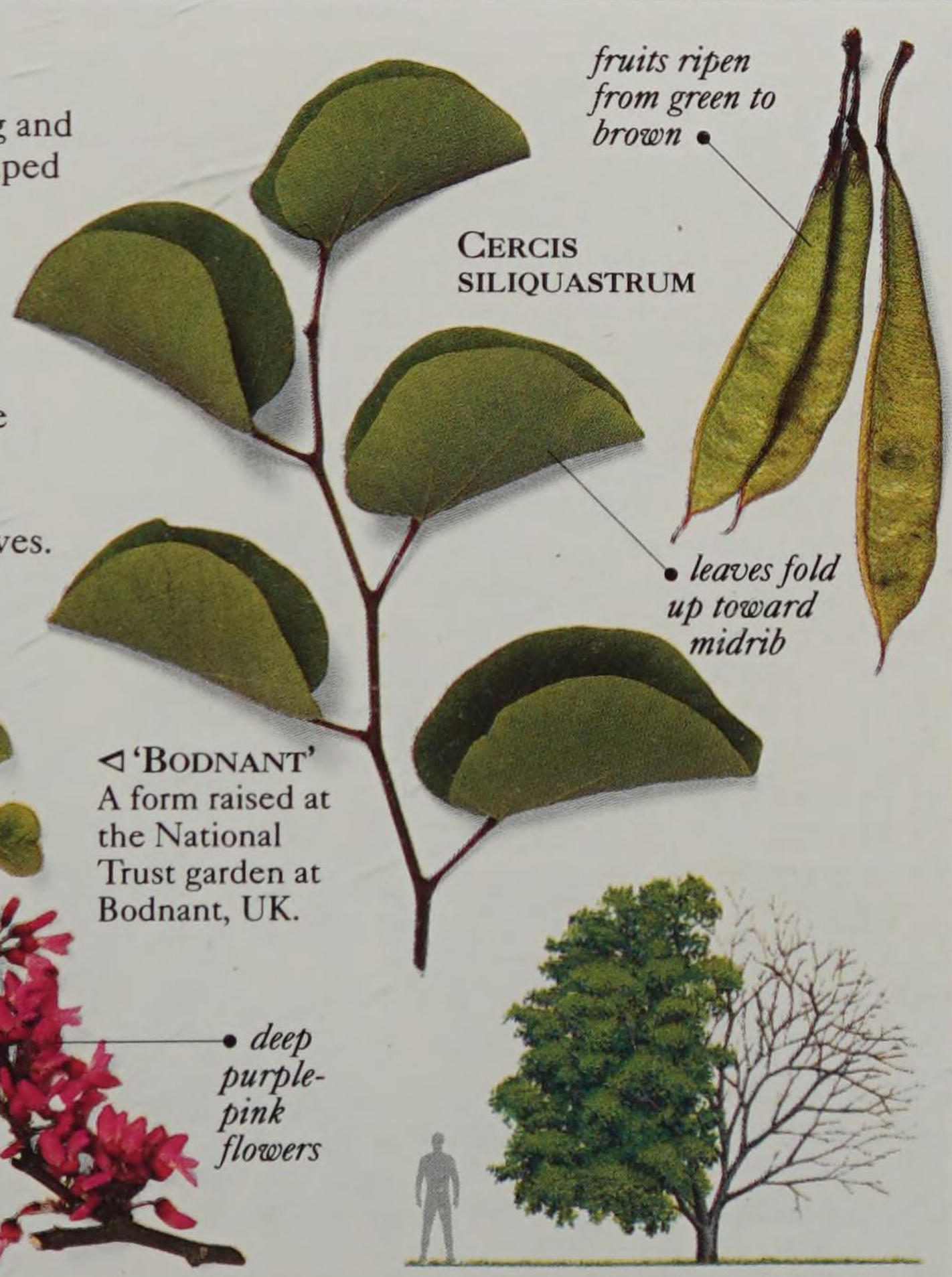
Family LEGUMINOSAE	Species *Cercis siliquastrum*	Author Linnaeus

JUDAS TREE

Leaves Rounded, to 4 in (10 cm) long and 4¾ in (12 cm) across, deeply heart-shaped at the base, untoothed, bronze when young becoming dark blue-green above, smooth. ***Bark*** Gray-brown, cracking into small, rectangular and square plates. ***Flowers*** Pealike, ¾ in (2 cm) long, pink, in clusters along the old shoots, and often from the main branches and trunk, in late spring to early summer before and with the leaves. ***Fruit*** A flattened pod, to 4 in (10 cm) long, green becoming pink ripening to brown, often persisting after the leaves fall.

• **NATIVE REGION** W. Asia, S.E. Europe.

• **HABITAT** Dry, rocky places.



◁ **'BODNANT'** A form raised at the National Trust garden at Bodnant, UK.

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family LEGUMINOSAE	Species *Cladrastis lutea*	Author K. Koch

YELLOW WOOD

Leaves Pinnate, with 7 to 11 elliptic to ovate, untoothed leaflets, to 4 in (10 cm) long, the terminal one largest, bright green above and smooth on both sides, turning bright yellow in autumn, the stalk swollen at the base and enclosing the bud. ***Bark*** Gray and smooth, often horizontally wrinkled. ***Flowers*** Pealike, 1¼ in (3 cm) long, white, slightly fragrant, in large, hanging panicles to 18 in (45 cm) long, at the ends of the shoots in early summer. ***Fruit*** A flattened brown pod, to 4 in (10 cm) long.

• **NATIVE REGION** S.E. United States.

• **HABITAT** Rich woods and rocky bluffs.

• **REMARK** Also known as virgilia. This species is rare in the wild, with a restricted distribution in only a few States. The wood produces a yellow dye.

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family LEGUMINOSAE	Species *Genista aetnensis*	Author (Bivona) Candolle

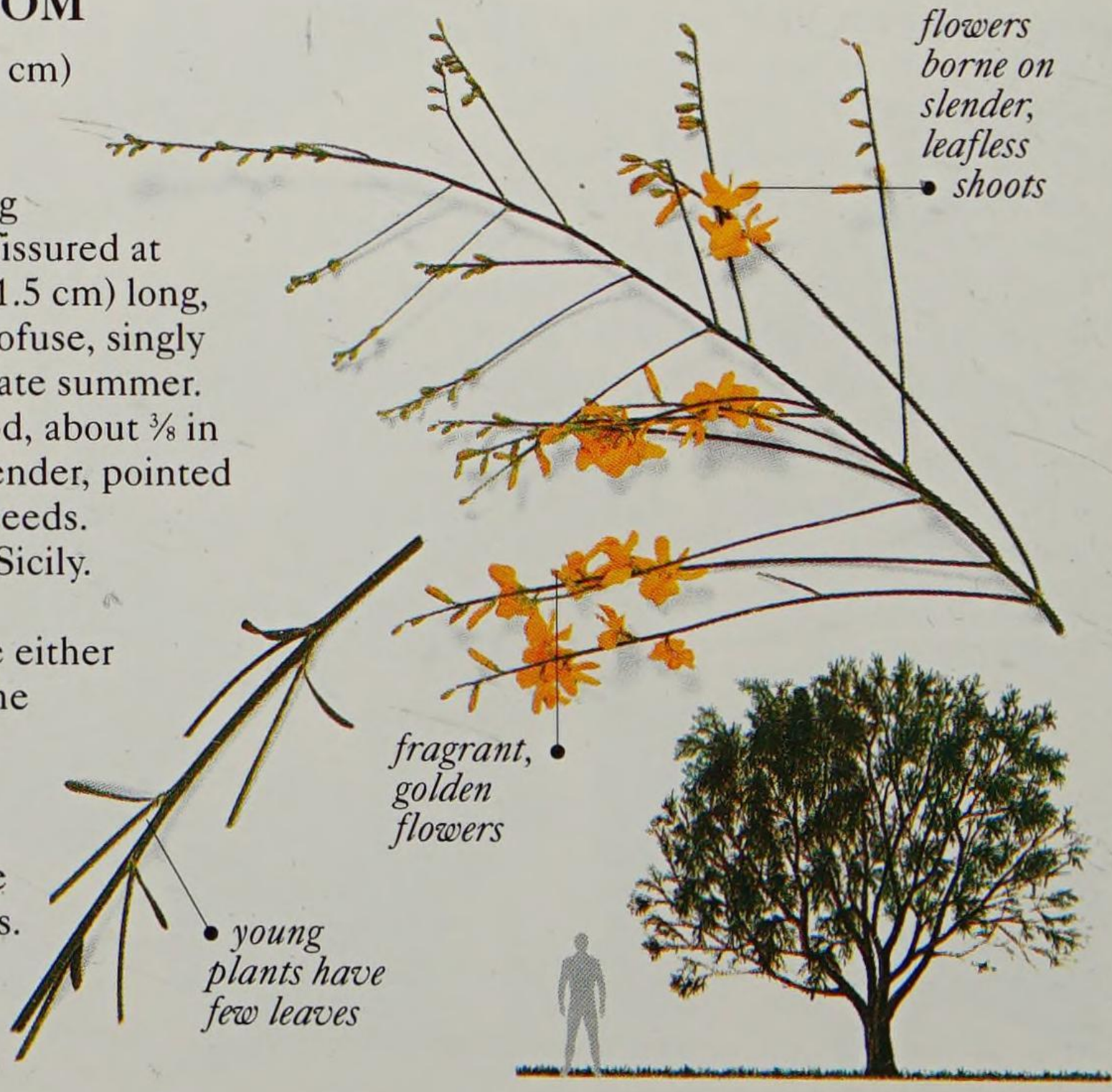
MOUNT ETNA BROOM

Leaves Linear and small, ⅜ in (1 cm) long, borne sparsely on slender, bright green shoots; on mature plants usually absent by flowering time. ***Bark*** Gray-brown, deeply fissured at the base. ***Flowers*** Pealike, ⅝ in (1.5 cm) long, bright golden yellow, fragrant, profuse, singly along the new shoots in mid- to late summer. ***Fruit*** A small, blackish brown pod, about ⅜ in (1 cm) long, ending in a short, slender, pointed tip, and containing two or three seeds.

• **NATIVE REGION** Sardinia, Sicily.

• **HABITAT** Rocky slopes.

• **REMARK** This species can be either a large shrub or a small tree. In the wild, it is found on the slopes of Mount Etna, in Sicily, where it grows on old volcanic lava. The rushlike shoots take over the role of photosynthesis from the leaves. They remain green even in the winter months, giving the tree an overall evergreen appearance.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family LEGUMINOSAE	Species *Gleditsia triacanthos*	Author Linnaeus

HONEY LOCUST

Leaves First leaves from spurs on the old wood pinnate, later leaves on new shoots usually bipinnate, with numerous small leaflets, to 1½ in (4 cm) long, minutely toothed, bright green, turning yellow in autumn; shoots usually spiny. ***Bark*** Dark gray, scaly, with clusters of branched spines. ***Flowers*** Males and females both very small and yellow-green, in separate small, cylindrical, mainly upright racemes to 2 in (5 cm) long, from the old shoots, on the same plant in early summer. ***Fruit*** A large, often twisted, brown, hanging pod, to 18 in (45 cm) long.

• **NATIVE REGION** North America.

• **HABITAT** Rich, moist woods.

• **REMARK** The fruits contain a sweet, edible flesh.

'SUNBURST' ▷
The foliage of this form matures from golden yellow to dark green.

Height 100 ft (30 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

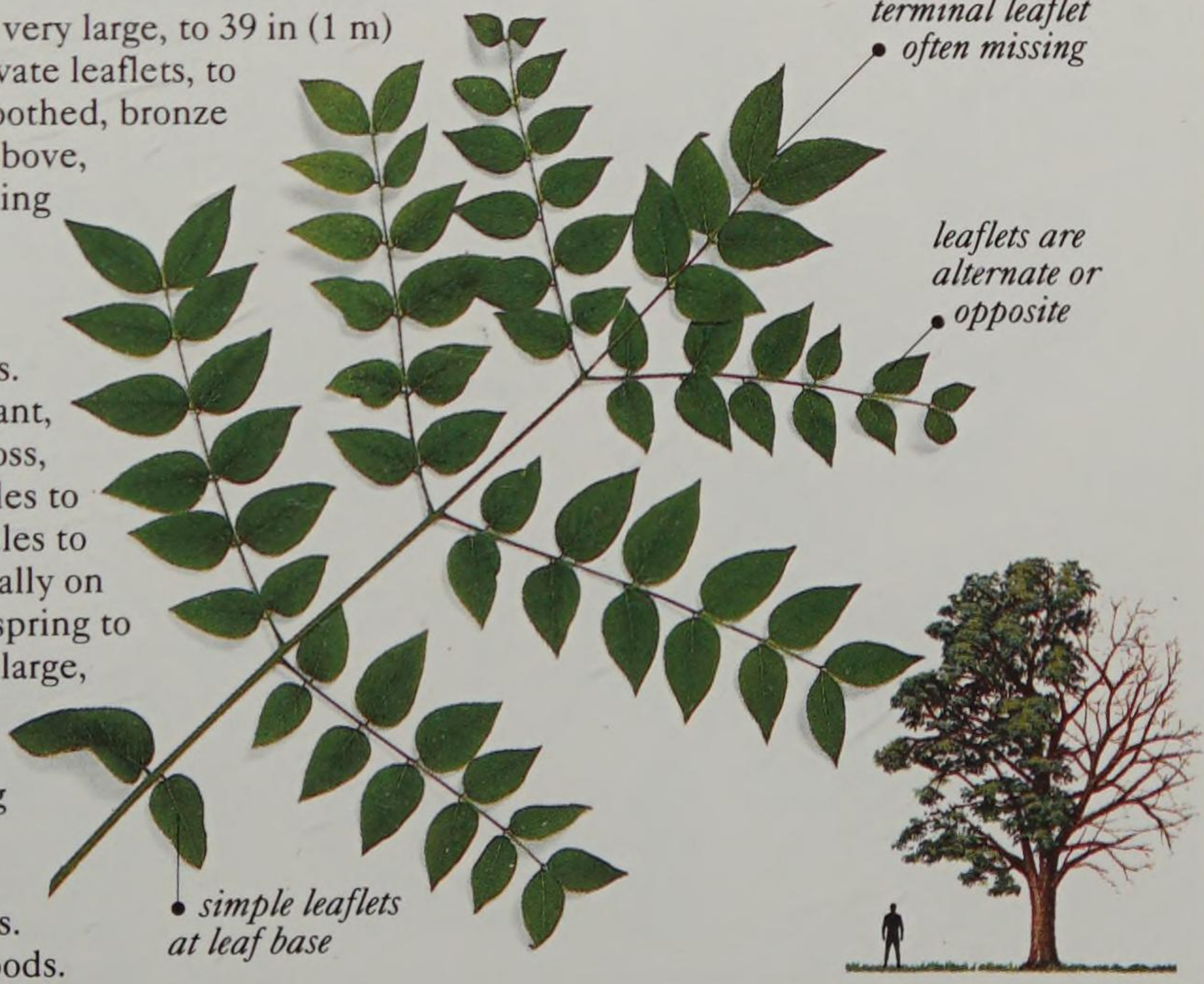
Family LEGUMINOSAE	Species *Gymnocladus dioica*	Author (Linnaeus) K. Koch

KENTUCKY COFFEE TREE

Leaves Bipinnate and very large, to 39 in (1 m) long, with numerous ovate leaflets, to 3 in (7.5 cm) long, untoothed, bronze becoming dark green above, bluish beneath, becoming smooth on both sides, on very stout shoots. ***Bark*** Dark brown and rough, with scaly ridges. ***Flowers*** Whitish, fragrant, about 1 in (2.5 cm) across, in conical panicles, males to 4 in (10 cm) long, females to 12 in (30 cm) long, usually on separate plants in late spring to early summer. ***Fruit*** A large, leathery, red-brown, hanging pod, to 10 in (25 cm) long, persisting for some time.

• **NATIVE REGION** C. and E. United States.

• **HABITAT** Moist woods.



Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family LEGUMINOSAE	Species + *Laburnocytisus adamii*	Author (Poiteau) Schneider

+ LABURNOCYTISUS ADAMII

Leaves Variable, with three leaflets, resembling one parent or intermediate between both parents. ***Bark*** Dark gray, smooth, shallowly fissured with age. ***Flowers*** Pealike, of three types, either yellow laburnum or purple broom, resembling one parent, or between the two, the intermediate flowers pale purple-pink flushed yellow, borne in short, hanging racemes to 6 in (15 cm) long, in late spring to early summer. ***Fruit*** A brown pod, to 3 in (7.5 cm) long, hanging in clusters, with black seeds, produced from the yellow flowers.

• **NATIVE REGION**
Of garden origin.

• **REMARK** A chimera, or graft hybrid, between the common laburnum *(Laburnum anagyroides*, see p.197) and the shrubby purple broom *(Cytisus purpureus)*. A graft hybrid is not a true hybrid, because it contains a mixture of the tissues of the two genetically distinct parents. All parts of this tree are poisonous.

intermediate leaves are dark green above, paler beneath

• *intermediate flowers carried on most branches*

Δ + LABURNOCYTISUS ADAMII

laburnum leaves are dull gray-green

◁ LABURNUM ANAGYROIDES
Common laburnum *(Laburnum anagyroides)* forms the inner core of the plant.

yellow laburnum flowers borne in drooping racemes

dense clusters of purple broom flowers borne on some branches

purple broom leaves have tiny leaflets

Δ CYTISUS PURPUREUS
The outer envelope of the tree is formed by purple broom *(Cytisus purpureus)*.

Height 20 ft (6 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family LEGUMINOSAE	Species *Laburnum alpinum*	Author (Miller) Berchtold & Presl

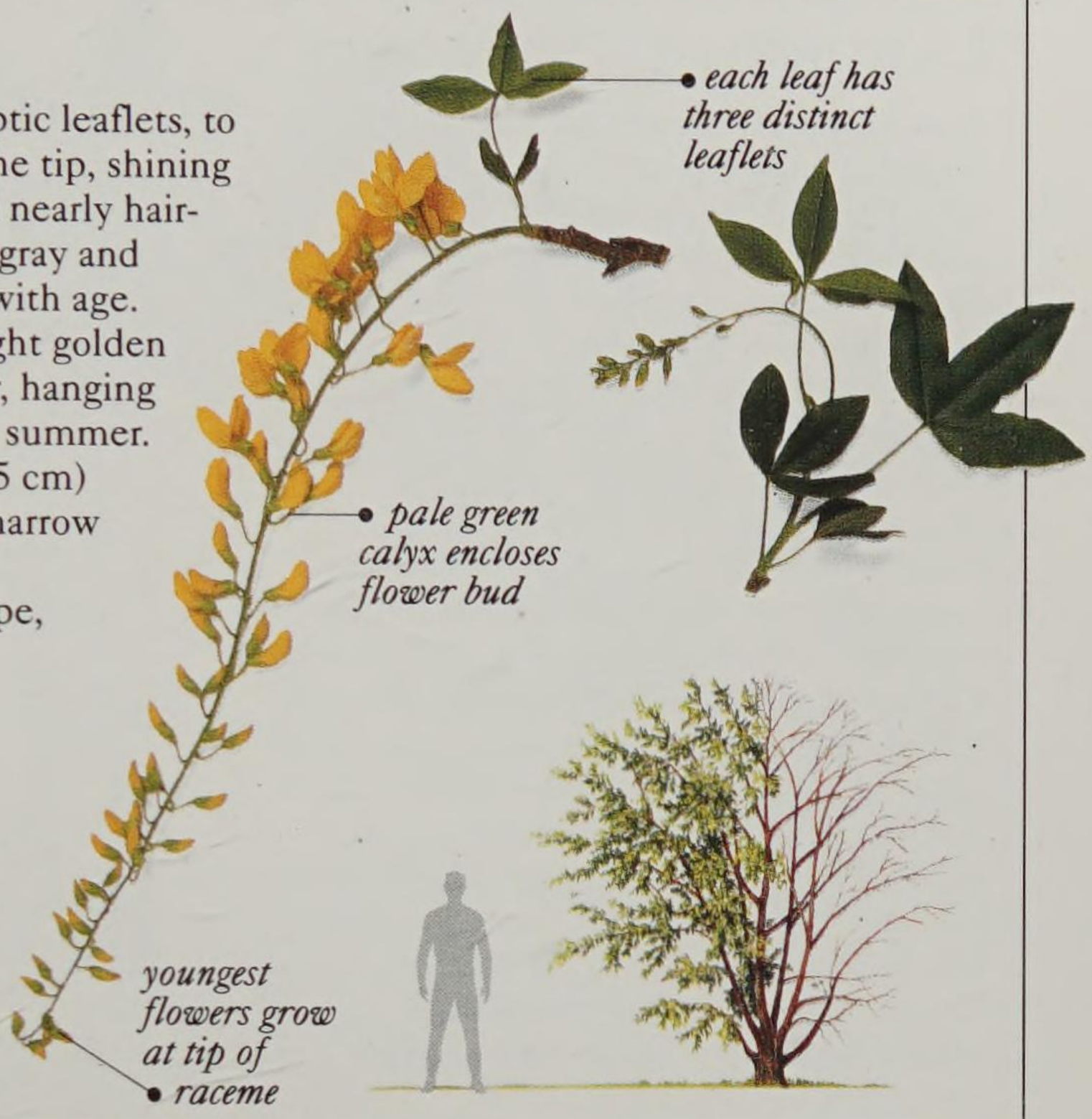
SCOTCH LABURNUM

Leaves Each with three separate, elliptic leaflets, to 4 in (10 cm) long, slightly pointed at the tip, shining deep green above, smooth, glossy, and nearly hairless when young beneath. ***Bark*** Dark gray and smooth, becoming shallowly fissured with age. ***Flowers*** Pealike, ¾ in (2 cm) long, bright golden yellow, fragrant, borne in long, slender, hanging racemes to 18 in (45 cm) long, in early summer. ***Fruit*** A hairless brown pod, to 3 in (7.5 cm) long, the upper margin flattened to a narrow wing, containing brown seeds.

• **NATIVE REGION** C. and S. Europe, from the Alps to Czechoslovakia and the Balkans.

• **HABITAT** Mountains.

• **REMARK** This latest-flowering laburnum can be a either a small tree or a shrub. The very long, delicate racemes of flowers are a particular feature of the species. All parts of the plant are poisonous if consumed, the seeds especially so.



Height 20 ft (6 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family LEGUMINOSAE	Species *Laburnum anagyroides*	Author Medikus

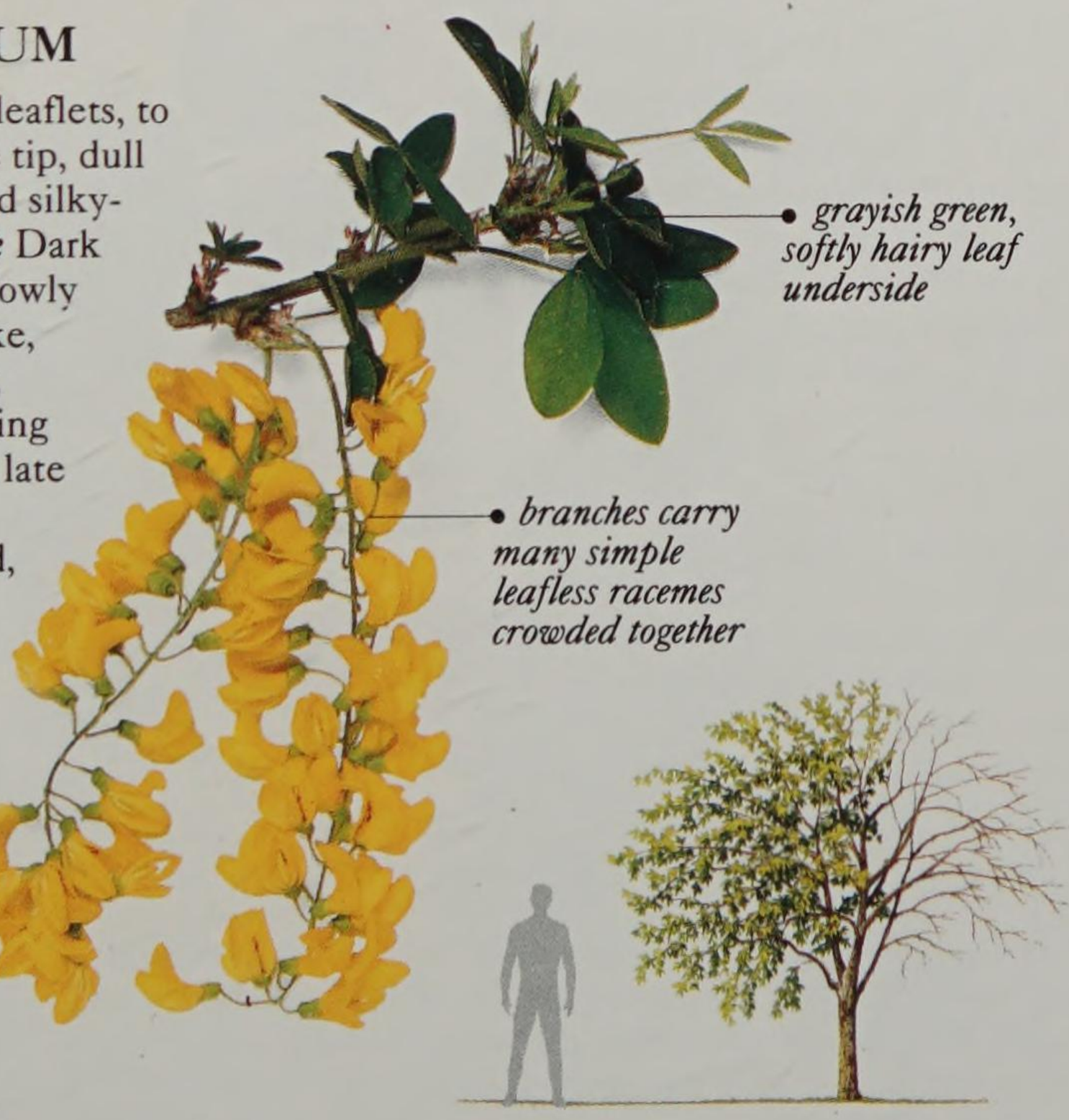
COMMON LABURNUM

Leaves Each with three elliptic leaflets, to 3½ in (9 cm) long, rounded at the tip, dull deep green above, gray-green and silky-hairy when young beneath. ***Bark*** Dark gray and smooth, becoming shallowly fissured with age. ***Flowers*** Pealike, 1 in (2.5 cm) long, golden yellow, densely clustered, borne in hanging racemes to 10 in (25 cm) long, in late spring to early summer. ***Fruit*** A slightly rounded hairy brown pod, to 3 in (7.5 cm) long, the upper edge thickened, hanging in clusters, with black seeds.

• **NATIVE REGION** C. and S. Europe.

• **HABITAT** Mountainous areas, woods, and thickets.

• **REMARK** All parts of the plant contain a harmful alkaloid and are poisonous if consumed. The immature seeds look like small green peas.



Height 23 ft (7 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family LEGUMINOSAE	Species *Laburnum x watereri*	Author (Wettstein) Dippel

LABURNUM X WATERERI

Leaves With three elliptic leaflets, to 3 in (7.5 cm) long, deep green above, hairy but green when young beneath. ***Bark*** Dark gray and smooth, becoming shallowly fissured with age. ***Flowers*** Pealike, 1 in (2.5 cm) long, golden yellow, borne in dense, hanging racemes to 12 in (30 cm) long, in late spring to early summer. ***Fruit*** A brown pod, to 2½ in (6 cm) long, with few seeds, often sparsely produced.

- **NATIVE REGION** Austria, Switzerland.
- **HABITAT** Mountains, with the parents.
- **REMARK** A hybrid between the Scotch laburnum *(L. alpinum*, see p.197) and the common laburnum *(L. anagyroides*, see p.197). It combines the long racemes of the former with the large flowers of the latter. The form shown, 'Vossii', is the most familiar. It bears its flowers in very long racemes, to 20 in (50 cm) or more.

Height 23 ft (7 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family LEGUMINOSAE	Species *Maackia chinensis*	Author Takeda

MAACKIA CHINENSIS

Leaves Pinnate, to 8 in (20 cm) long, with 9 to 13 elliptic to ovate, untoothed and shortly stalked leaflets, to 2½ in (6 cm) long and ¾ in (2 cm) across, silvery blue-gray when young becoming green above, downy beneath. ***Bark*** Gray-brown, marked with conspicuous lenticels. ***Flowers*** Pealike, ⅜ in (1 cm) long, white, borne in dense, upright racemes, clustered at the ends of the shoots in mid- to late summer. ***Fruit*** A small pod, about 2 in (5 cm) long.

- **NATIVE REGION** S.W. China.
- **HABITAT** Woods and scrub in mountains.
- **REMARK** This genus is related to *Cladrastis* (see p.194), but is distinguished by its flowers, which are borne in upright, rather than hanging, clusters.

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family LEGUMINOSAE	Species *Robinia x holdtii*	Author Beissner

ROBINIA X HOLDTII

Leaves Pinnate, to 18 in (45 cm) long, with up to 21 oblong leaflets, to 2 in (5 cm) long and 1 in (2.5 cm) across, often indented at the tip with a very fine point, deep green above, gray-green beneath, thinly hairy on both sides. ***Bark*** Gray-brown, deeply furrowed, with scaly ridges. ***Flowers*** Pealike, ¾ in (2 cm) long, white flushed purplish pink, faintly fragrant, in hanging clusters over a long period in summer. ***Fruit*** A slightly sticky, bristly, red pod, about 2½ in (6 cm) long.

• **NATIVE REGION** Of garden origin.

• **REMARK** This vigorous tree is a hybrid between the pink-flowered, often shrubby, *Robinia luxurians* and the black locust *(Robinia pseudoacacia*, see below). Of the two parent plants, it is most similar in appearance and habit to *R. pseudoacacia*, from which it is distinguished by the color of its flowers.

Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family LEGUMINOSAE	Species *Robinia pseudoacacia*	Author Linnaeus

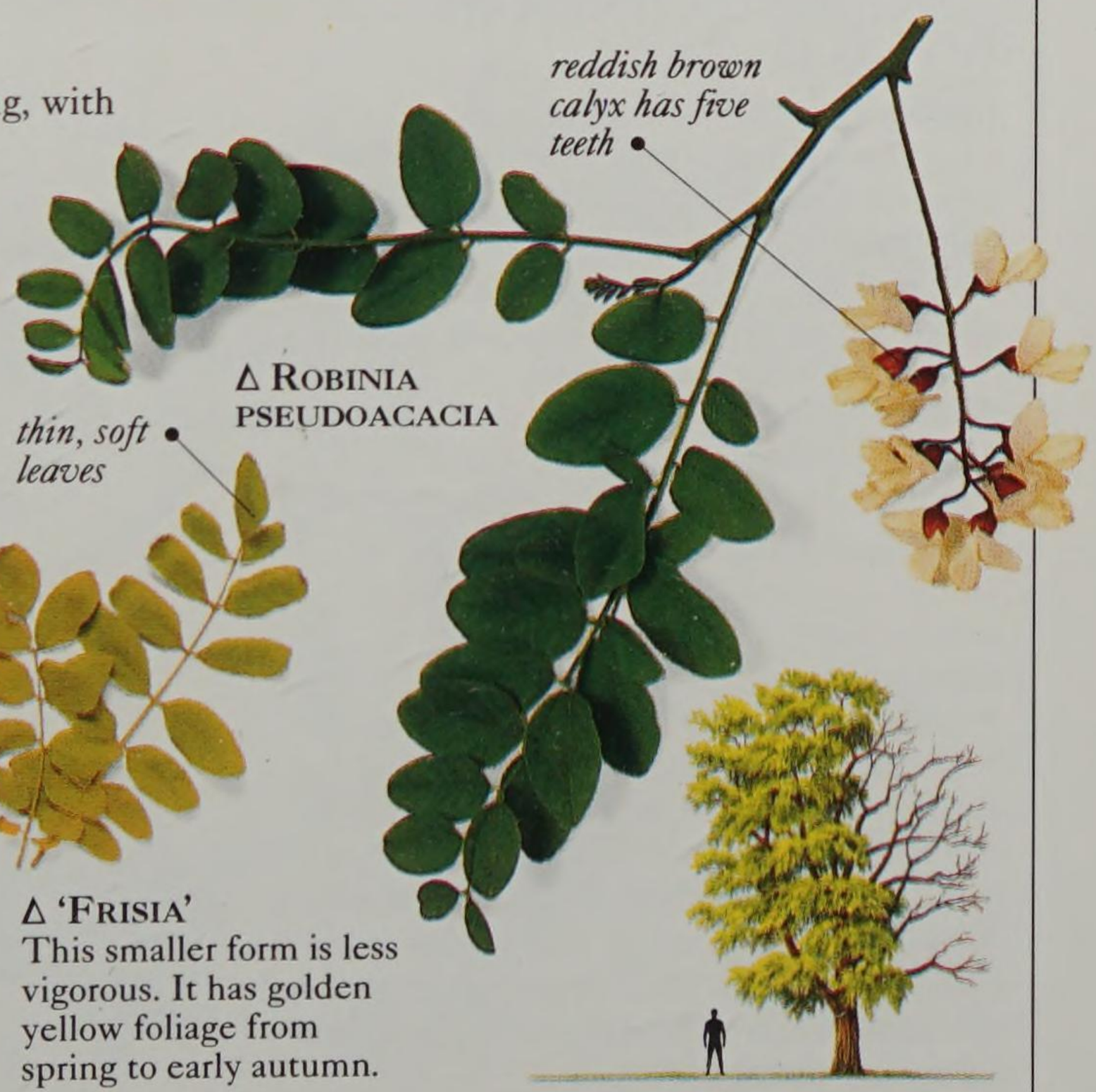
BLACK LOCUST

Leaves Pinnate, to 12 in (30 cm) long, with 11 to 21 elliptic to ovate, untoothed leaflets, to 2 in (5 cm) long, often indented and ending in a slender point, blue-green above, gray-green and thinly hairy becoming smooth beneath, the shoot often with two spines at the base of each leaf. ***Bark*** Gray-brown, deeply furrowed, with scaly ridges. ***Flowers*** Pealike, ¾ in (2 cm) long, white, with a yellow-green blotch, fragrant, in dense, hanging racemes to 8 in (20 cm) long, in early to midsummer. ***Fruit*** A smooth, dark brown, hanging pod, to 4 in (10 cm) long.

• **NATIVE REGION** S.E. United States.

• **HABITAT** Woods and thickets.

• **REMARK** Widely planted and naturalized in North America.



Δ ROBINIA PSEUDOACACIA

Δ 'FRISIA'
This smaller form is less vigorous. It has golden yellow foliage from spring to early autumn.

Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family LEGUMINOSAE	Species *Sophora japonica*	Author Linnaeus

JAPANESE PAGODA TREE

Leaves Pinnate, to 10 in (25 cm) long, with 7 to 17 ovate, pointed leaflets, to 2 in (5 cm) long, whitish becoming glossy dark green above, blue-green and hairy beneath, sometimes turning yellow in autumn. ***Bark*** Gray-brown, prominently ridged. ***Flowers*** Pealike, ⅝ in (1.5 cm) long, white, fragrant, in hanging panicles to 12 in (30 cm) long, at the ends of the shoots in late summer to early autumn. ***Fruit*** A pod, to 3 in (7.5 cm) long, constricted between the seeds.

• **NATIVE REGION** China, Korea.

• **HABITAT** Woods, thickets, and dry valleys in mountains.

• **REMARK** Also known as pagoda tree.

Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family LEGUMINOSAE	Species *Sophora microphylla*	Author Aiton

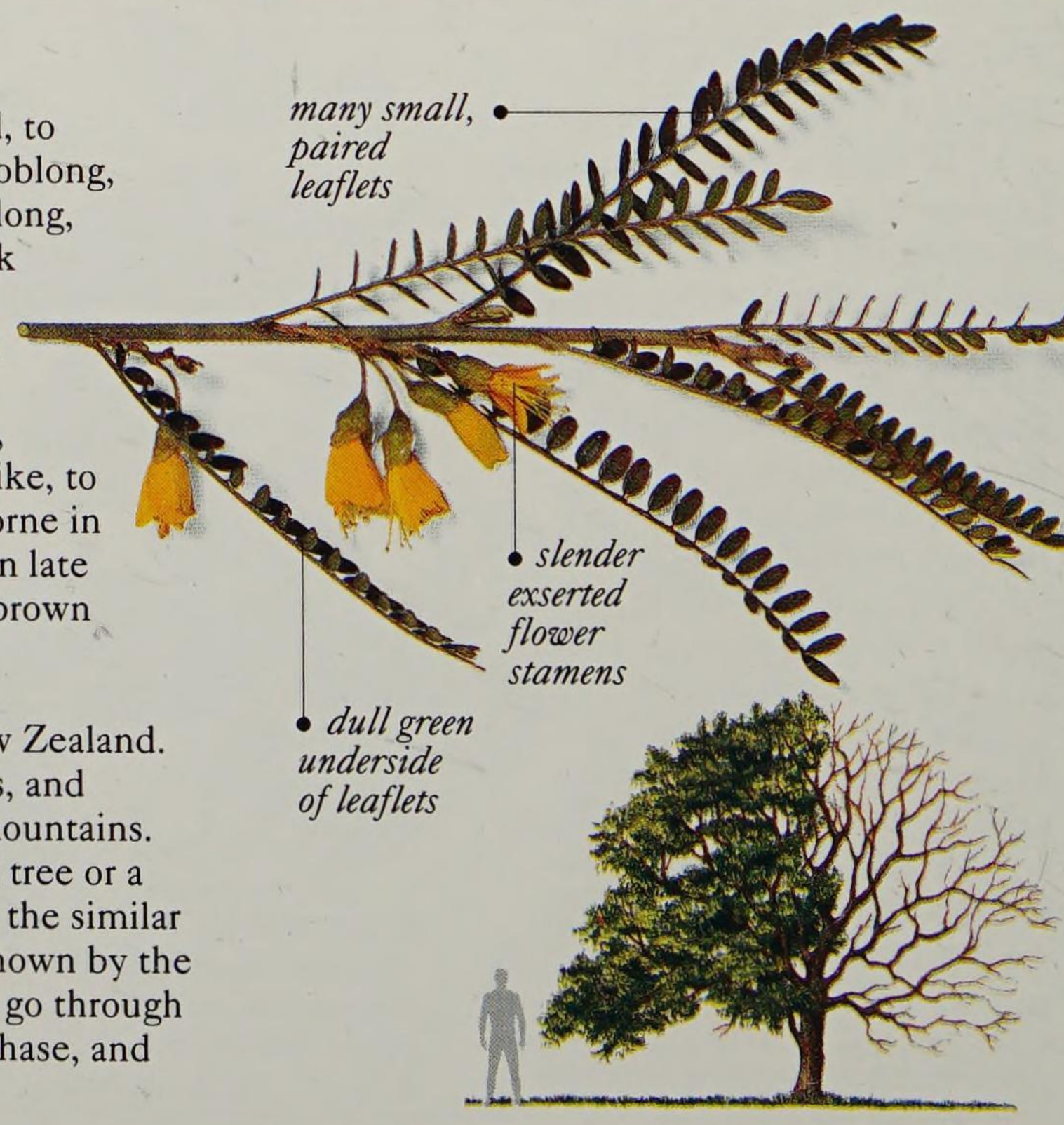
KOWHAI

Leaves Pinnate to nearly rounded, to 6 in (15 cm) long, with numerous oblong, untoothed leaflets, to ⅜ in (1 cm) long, rounded or notched at the tip, dark green above, dull green beneath, silky-hairy when young becoming smooth, on silky-hairy shoots. ***Bark*** Gray to gray-brown, smooth, with small lenticels. ***Flowers*** Pealike, to 2 in (5 cm) long, golden yellow, borne in hanging racemes in the leaf axils in late winter to spring. ***Fruit*** A winged brown pod, to 6 in (15 cm) or more long, hairy when young.

• **NATIVE REGION** Chile, New Zealand.

• **HABITAT** Forests, open places, and riverbanks from sea level to the mountains.

• **REMARK** Can be either a small tree or a large shrub. It is closely related to the similar *Sophora tetraptera*, which is also known by the common name kowhai. Seedlings go through an intricately branched juvenile phase, and take many years to flower.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

MAGNOLIACEAE

THIS FAMILY of 12 genera and about 200 species is distributed in two main areas. Most species are found in east Asia, from the Himalayas through China to Japan, and in Southeast Asia to New Guinea; relatively few occur from the eastern United States through Mexico to tropical South America. The deciduous and evergreen trees and shrubs have alternate, untoothed, and (only occasionally) lobed leaves. The showy flowers are borne singly.

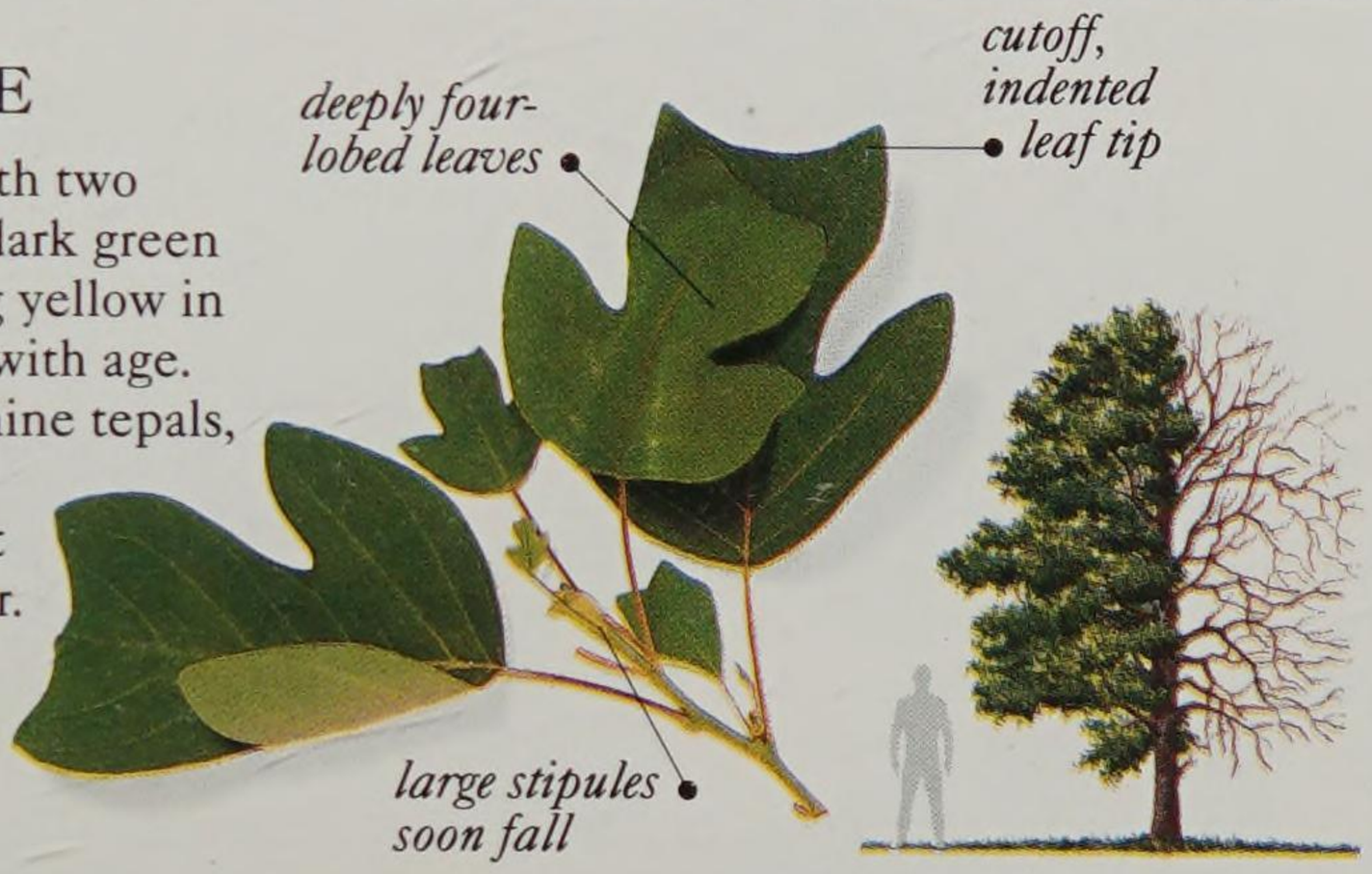
Family MAGNOLIACEAE	Species *Liriodendron chinense*	Author (Hemsley) Sargent

CHINESE TULIP TREE

Leaves To 6 in (15 cm) or longer, with two lobes at the tip and two at the side, dark green above, bluish white beneath, turning yellow in autumn. ***Bark*** Gray, rough, fissured with age. ***Flowers*** To 1½ in (4 cm) long, with nine tepals, three green, reflexed, six green with yellow veins, upright, borne singly at the ends of the shoots in midsummer. ***Fruit*** A conical, pale brown cluster.

• **NATIVE REGION**
China, Vietnam.

• **HABITAT** Mountain woods.



Height 50 ft (15 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

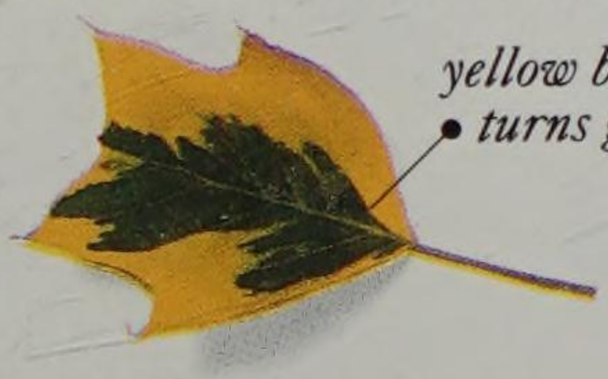
Family MAGNOLIACEAE	Species *Liriodendron tulipifera*	Author Linnaeus

TULIP TREE

Leaves To 6 in (15 cm) or longer, with two lobes at the tip and two at the side, dark green above, bluish white beneath, turning yellow to orange in autumn. ***Bark*** Gray-brown, furrowed with age. ***Flowers*** To 2½ in (6 cm) long, with nine tepals, three green, reflexed, six pale green banded orange near the base, singly at the ends of the shoots in midsummer. ***Fruit*** A conical, pale brown cluster.

• **NATIVE REGION** E. North America.

• **HABITAT** Deciduous woods.



Δ 'AUREOMARGINATUM'
The leaves of this impressive form have a broad, golden-yellow margin at first.

Height 164 ft (50 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family MAGNOLIACEAE	Species *Magnolia acuminata*	Author Linnaeus

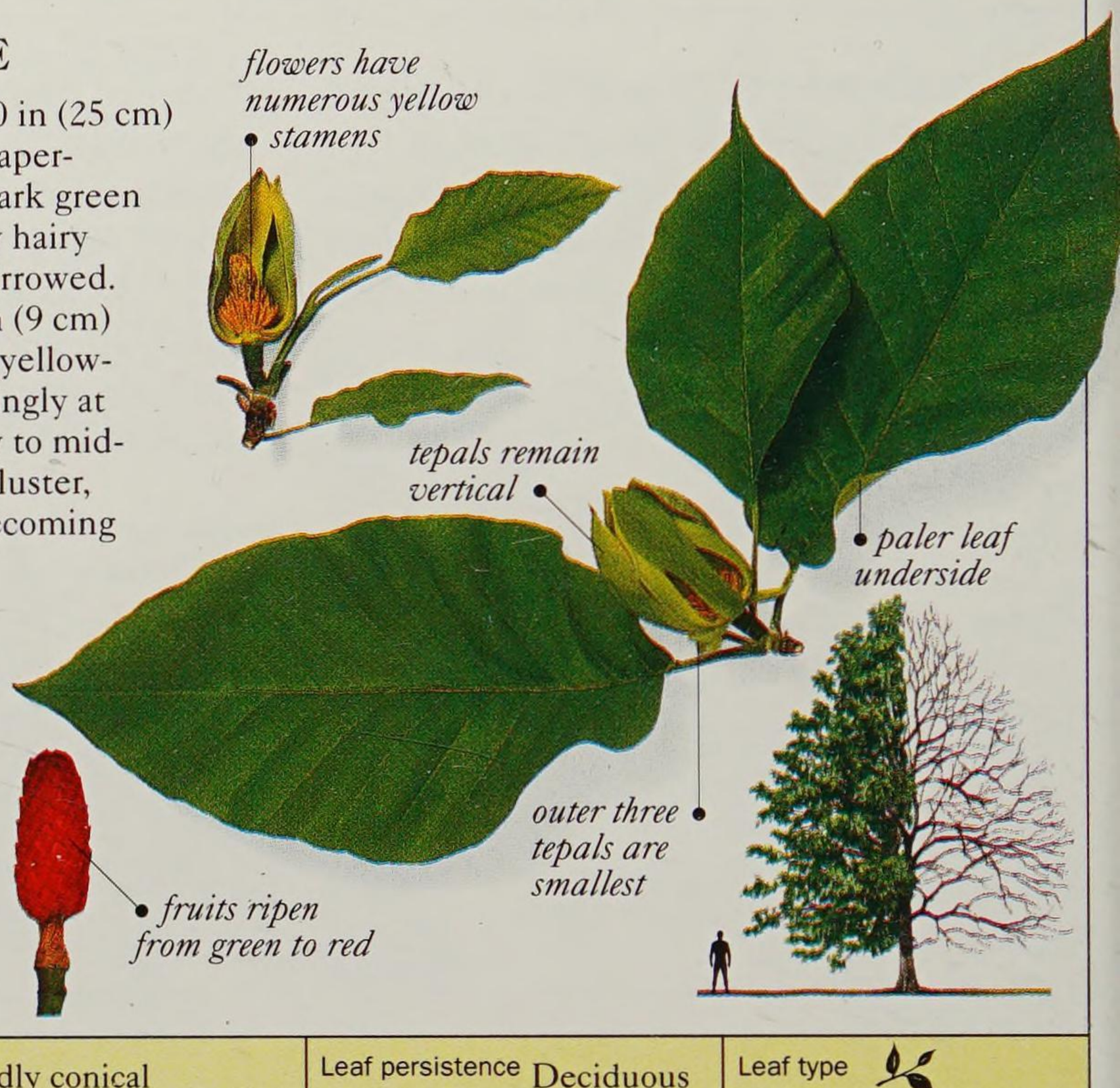
CUCUMBER TREE

Leaves Elliptic to ovate, to 10 in (25 cm) long and 6 in (15 cm) across, taper-pointed, untoothed, light to dark green above, blue-green and usually hairy beneath. ***Bark*** Brown-gray, furrowed. ***Flowers*** Cup-shaped, to 3½ in (9 cm) long, with nine blue-green to yellow-green, upright tepals, borne singly at the ends of the shoots in early to mid-summer. ***Fruit*** A cylindrical cluster, to 3 in (7.5 cm) long, green becoming pink ripening to red.

• **NATIVE REGION**
E. North America.

• **HABITAT** Rich woods.

• **REMARK** The species gets its common name from the color and shape of the unripe fruit, which resembles a cucumber. The flowers are often hidden by the large leaves.



Height 100 ft (30 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family MAGNOLIACEAE	Species *Magnolia ashei*	Author Weatherby

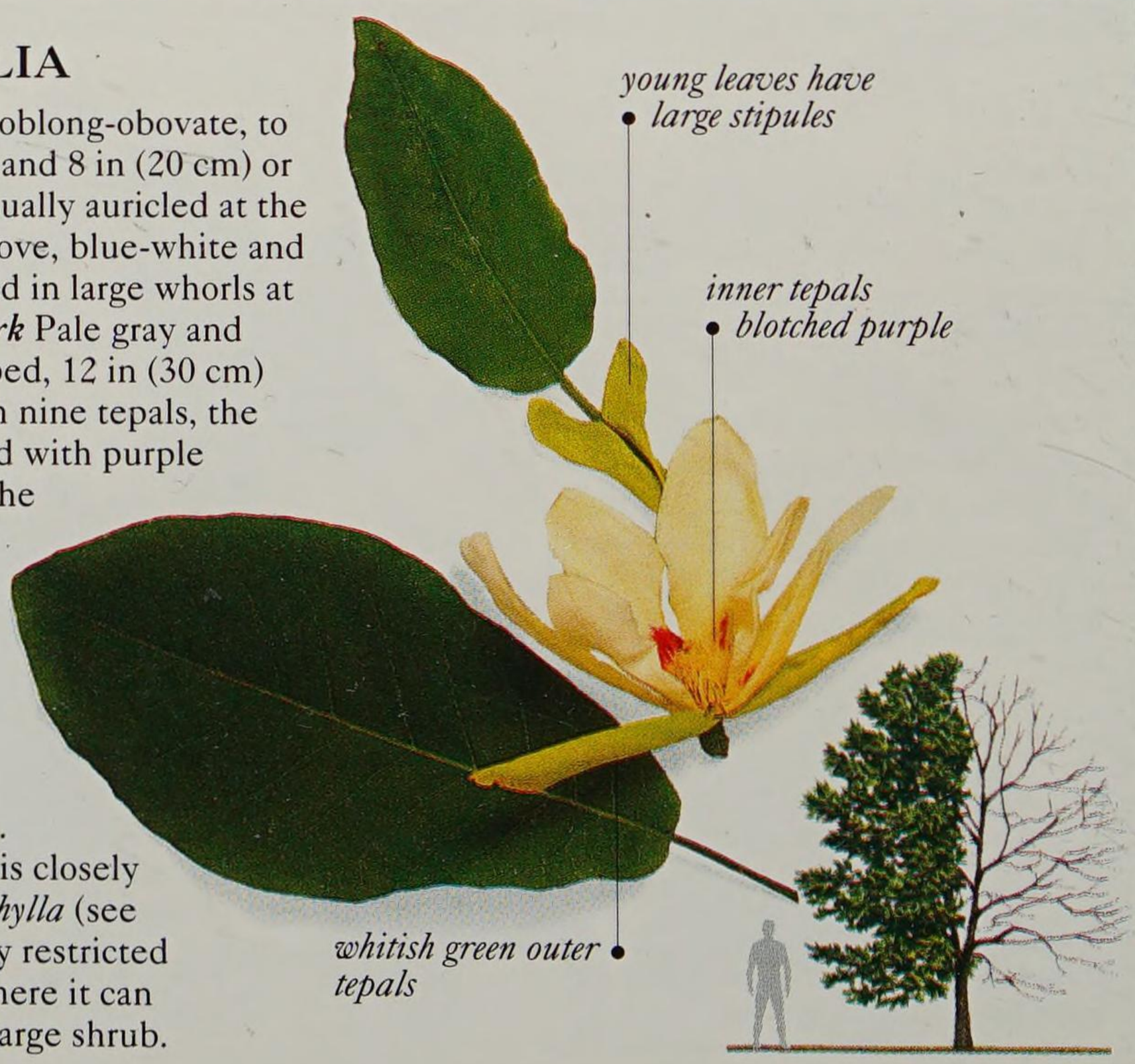
ASHEI MAGNOLIA

Leaves Broadly elliptic to oblong-obovate, to 12 in (30 cm) or more long and 8 in (20 cm) or more across, rather thin, usually auricled at the base, green and smooth above, blue-white and finely hairy beneath, carried in large whorls at the ends of the shoots. ***Bark*** Pale gray and smooth. ***Flowers*** Cup-shaped, 12 in (30 cm) across, white, fragrant, with nine tepals, the inner tepals usually marked with purple toward the base, borne at the ends of the shoots in early to midsummer with the leaves. ***Fruit*** A conical to egg-shaped pink cluster, about 3 in (7.5 cm) long.

• **NATIVE REGION**
N.W. Florida.

• **HABITAT** Moist woods.

• **REMARK** This species is closely related to *Magnolia macrophylla* (see p.209). It is rare and of very restricted distribution in the wild, where it can be either a small tree or a large shrub.



Height 33 ft (10 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family MAGNOLIACEAE	Species *Magnolia campbellii*	Author J.D. Hooker & Thomson

MAGNOLIA CAMPBELLII

Leaves Oblong to ovate or obovate, to 10 in (25 cm) or more long, usually abruptly pointed, untoothed, bronze when young becoming dark green and smooth above, paler and smooth or hairy beneath. ***Bark*** Gray and smooth. ***Flowers*** Very large, 12 in (30 cm) across, pale to deep pink to purplish pink or white, slightly fragrant, with up to 16 tepals, the outer tepals spreading, the inner tepals upright, giving the flower its characteristic cup-and-saucer shape, carried on smooth stalks, opening in late winter to early spring before the leaves. ***Fruit*** A cylindrical, conelike red cluster, to 6 in (15 cm) long.

• **NATIVE REGION** S.W. China, Himalayan mountains.

• **HABITAT** Forests in mountainous areas.

• **REMARK** A magnificent, large tree, much sought after in gardens for its huge flowers. On plants raised from seed, flowers are produced only after 20 years.

MAGNOLIA CAMPBELLII

Δ MAGNOLIA CAMPBELLII

Δ SUBSP. MOLLICOMATA
The flowers of this subspecies are produced slightly earlier in the year on younger plants.

Height 100 ft (30 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family MAGNOLIACEAE	Species *Magnolia dawsoniana*	Author Rehder & Wilson

MAGNOLIA DAWSONIANA

Leaves Elliptic to obovate, to 6 in (15 cm) long and 3 in (7.5 cm) across, rounded at the tip, dark green and smooth above, paler and smooth except for hairs along the veins beneath. ***Bark*** Gray, smooth, with raised lenticels, fissured at the base. ***Flowers*** Held horizontally, to 4¾ in (12 cm) long, pale pink, slightly fragrant, with 9 to 12 drooping tepals, opening in late winter or early spring before the leaves. ***Fruit*** A cylindrical, reddish green cluster, to 4 in (10 cm) long.

• **NATIVE REGION** W. China.

• **HABITAT**
Mountain woods.

• **REMARK**
One of the earliest-flowering magnolias.

Height 40 ft (12 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

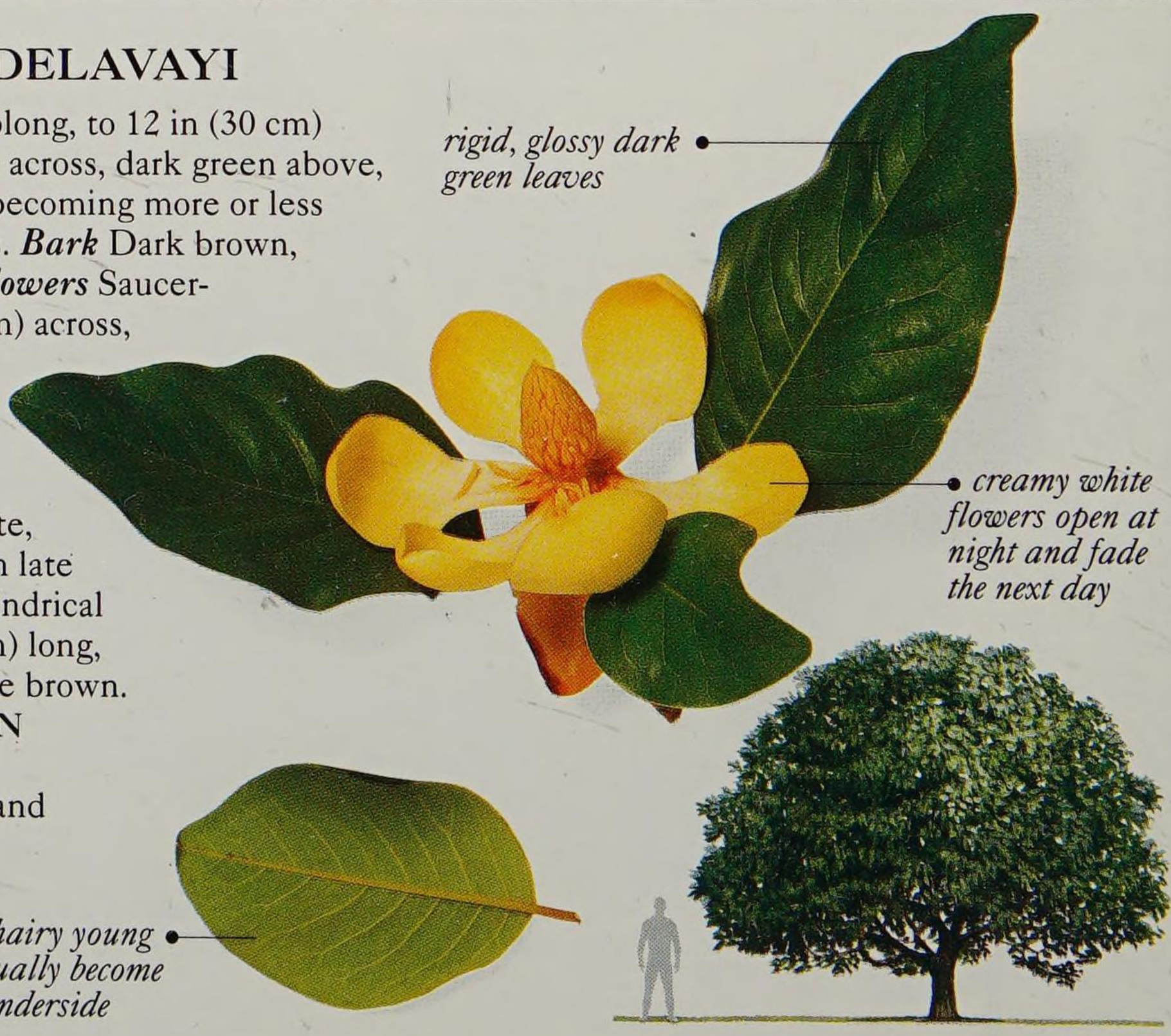
Family MAGNOLIACEAE	Species *Magnolia delavayi*	Author Franchet

MAGNOLIA DELAVAYI

Leaves Elliptic to oblong, to 12 in (30 cm) long and 6 in (15 cm) across, dark green above, downy when young becoming more or less smooth on both sides. ***Bark*** Dark brown, vertically fissured. ***Flowers*** Saucer-shaped, to 8 in (20 cm) across, fragrant, with nine fleshy tepals, the outer three greenish white, reflexed, the inner six creamy white, spreading, opening in late summer. ***Fruit*** A cylindrical cluster, to 4 in (10 cm) long, green ripening to pale brown.

• **NATIVE REGION**
S.W. China.

• **HABITAT** Scrubland and open places.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

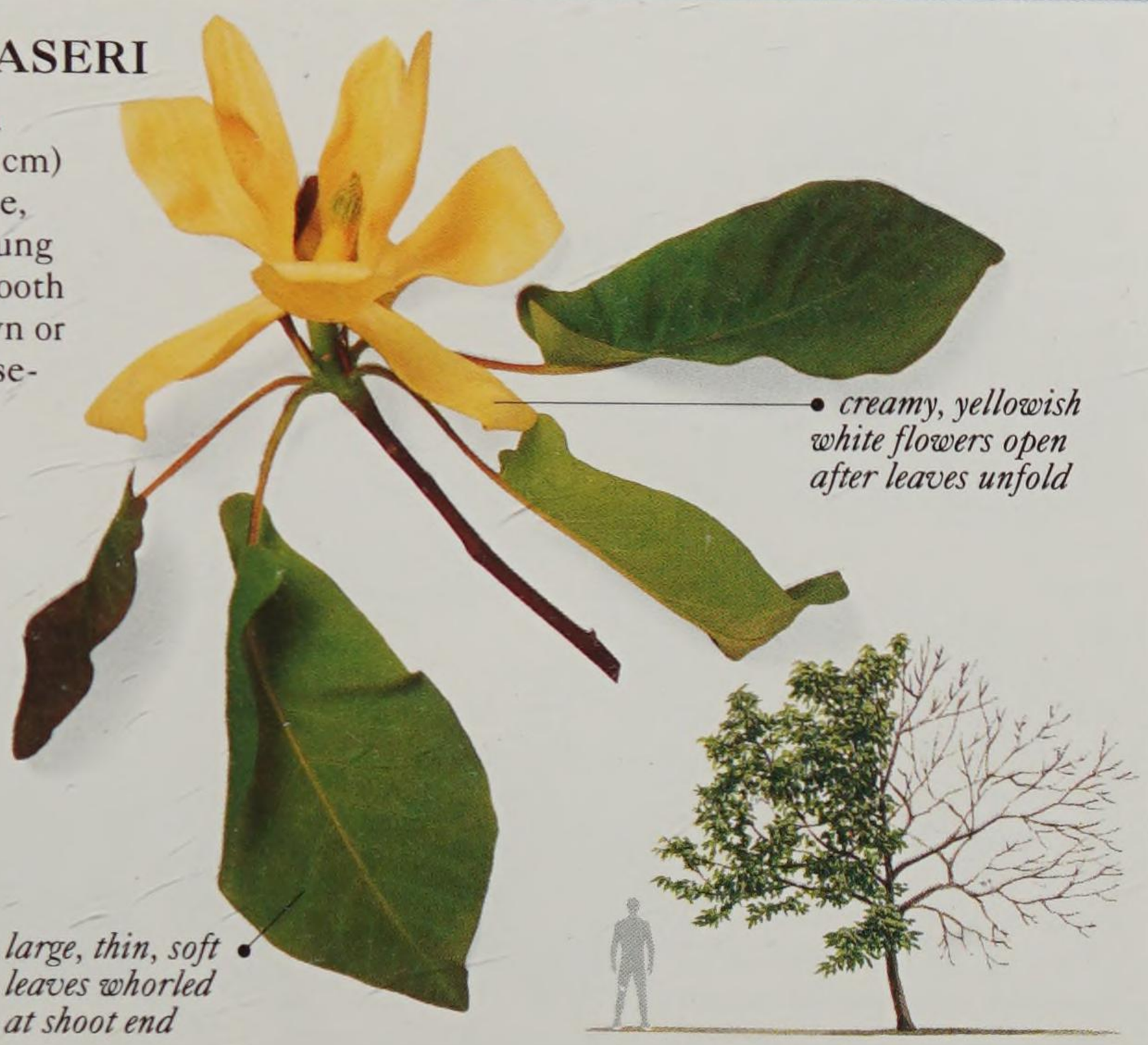
Family MAGNOLIACEAE	Species *Magnolia fraseri*	Author Walter

MAGNOLIA FRASERI

Leaves Obovate, to 16 in (40 cm) long and 8 in (20 cm) across, auricled at the base, pointed, bronze when young becoming pale green, smooth on both sides. ***Bark*** Brown or gray, smooth. ***Flowers*** Vase-shaped in bud, to 4¾ in (12 cm) long, opening saucer-shaped, the nine tepals creamy white flushed green on the outer surface, singly at the ends of the shoots in late spring to early summer. ***Fruit*** A cone-like, red cluster, to 4 in (10 cm) long.

• **NATIVE REGION** S.E. United States.

• **HABITAT** Rich mountain forests.



Height 46 ft (14 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family MAGNOLIACEAE	Species *Magnolia grandiflora*	Author Linnaeus

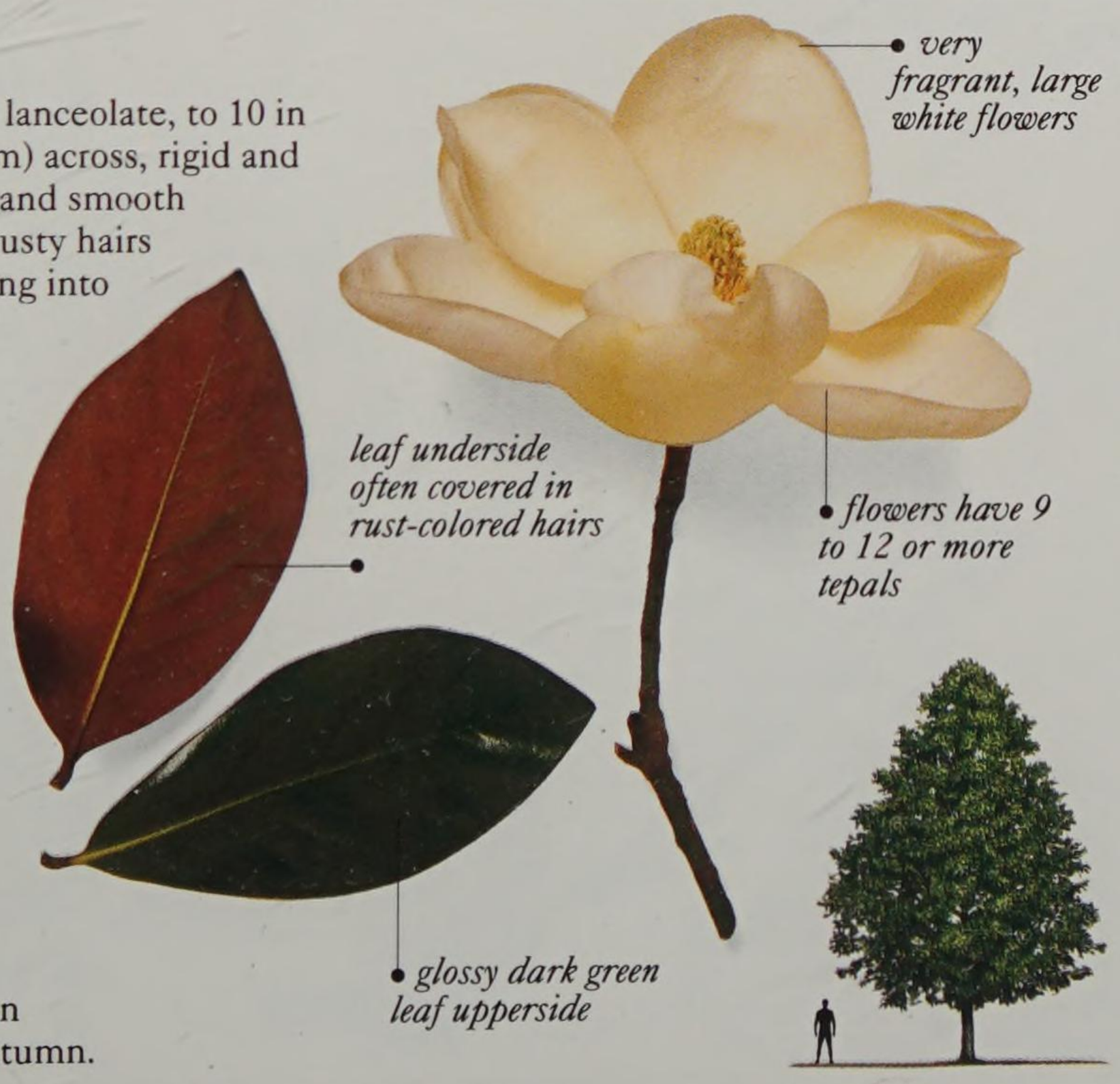
BULL BAY

Leaves Elliptic to ovate or lanceolate, to 10 in (25 cm) long and 4 in (10 cm) across, rigid and leathery, glossy dark green and smooth above, paler or covered in rusty hairs beneath. ***Bark*** Gray, cracking into small plates. ***Flowers*** Cup-shaped, to 12 in (30 cm) across, creamy white, fragrant, with 9 to 12 thick tepals, borne singly at the ends of the shoots in early summer. ***Fruit*** An egg-shaped red cluster, to 4 in (10 cm) long.

• **NATIVE REGION** S.E. United States.

• **HABITAT** Riverbanks and moist places on coastal plain.

• **REMARK** Plants cultivated in areas that are cooler than the native region flower in late summer to autumn.



Height 80 ft (25 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family MAGNOLIACEAE	Species *Magnolia* 'Heaven Scent'	Author None

MAGNOLIA 'HEAVEN SCENT'

Leaves Broadly elliptic, to 8 in (20 cm) long, pointed at the tip, glossy green above, paler beneath. ***Bark*** Gray and smooth. ***Flowers*** Upright and vase-shaped, 5 in (13 cm) long, narrow at first later opening more widely, strongly fragrant, the nine tepals pale pink but more deeply shaded towards the base, with a distinct, darker pink band on the back, opening in spring to early summer before and with the leaves. ***Fruit*** Conelike, the ripe seeds protruding and hanging for some time.

• **NATIVE REGION** Of garden origin.

• **REMARK** This hybrid between the shrubby *M. liliiflora* 'Nigra' and *M.* x *veitchii* (see p.214) is one of the Gresham Hybrids that resulted from Drury Todd Gresham's program of hybridization in California in the 1950s. By careful selection of both parents and offspring, he produced small trees that combine attributes of some of the best magnolias. 'Peppermint Stick' and 'Sayonara' belong also to this group.

pointed tepals spread slightly as flower ages

'HEAVEN SCENT'

tepals eventually spread wider

◁ **'PEPPERMINT STICK'**
The buds of this hybrid between *M. liliiflora* and *M.* x *veitchii* are 4½ in (11 cm) long.

very faint pink flush at flower base

distinctively narrow buds

Δ **'SAYONARA'**
This tree is a hybrid between *Magnolia* x *soulangeana* 'Lennei Alba' and *Magnolia* x *veitchii* 'Rubra.' The abundant flowers, which have fleshy tepals, are 4 in (10 cm) long.

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

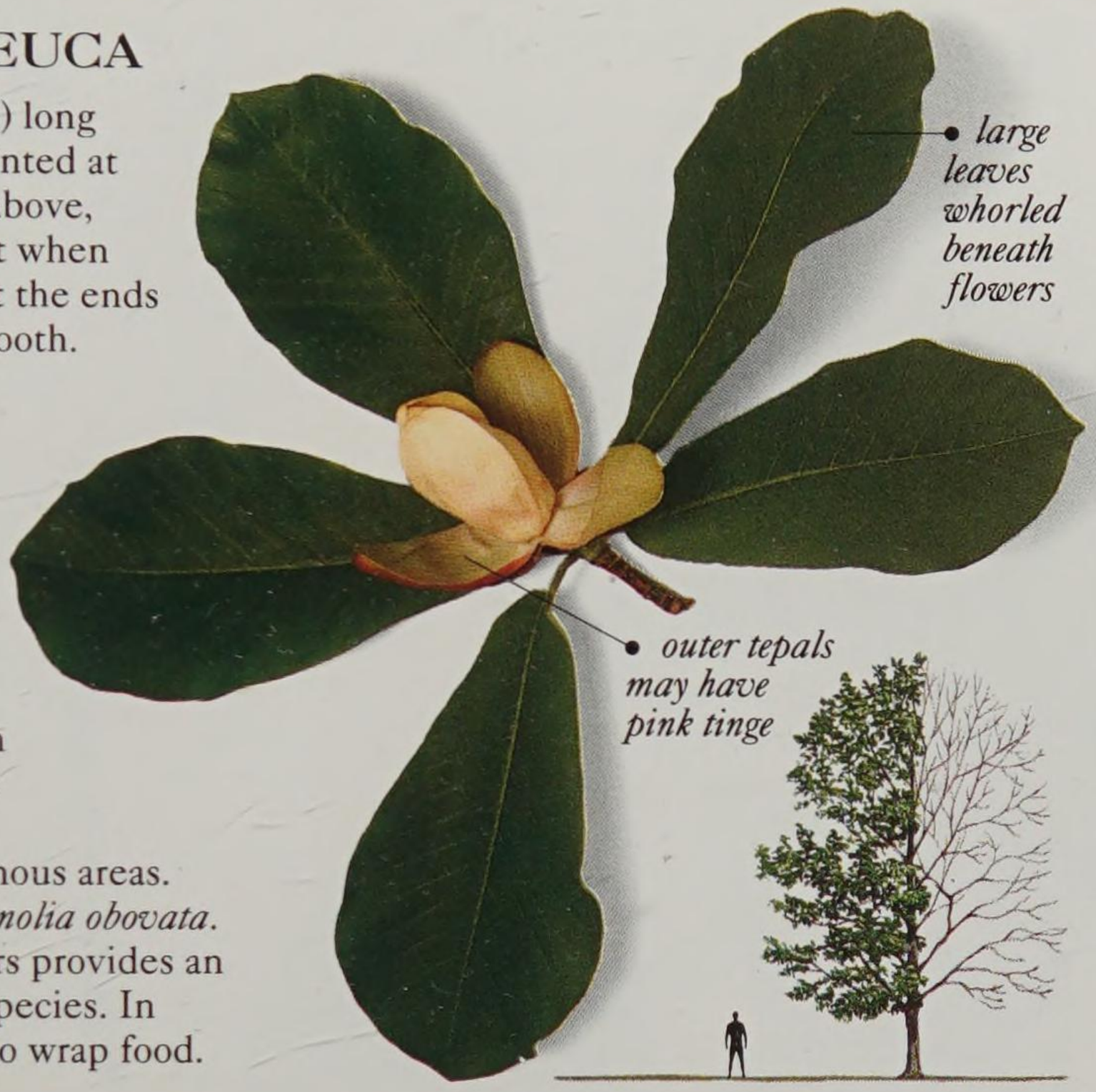
Family MAGNOLIACEAE	Species *Magnolia hypoleuca*	Author Siebold & Zuccarini

MAGNOLIA HYPOLEUCA

Leaves Obovate, to 18 in (45 cm) long and 8 in (20 cm) across, short-pointed at the tip, deep green and smooth above, pale blue-green and hairy at least when young beneath, in large whorls at the ends of the shoots. ***Bark*** Gray and smooth. ***Flowers*** Large, cup-shaped, 8 in (20 cm) across, very strongly fragrant, with 9 to 12 creamy white tepals, the outer tepals sometimes tinged pink, the filaments and stigmas bright red, opening in summer. ***Fruit*** A cylindrical, large, red cluster, to 8 in (20 cm) long, from which red seeds hang when ripe.

- **NATIVE REGION** Japan.
- **HABITAT** Woods in mountainous areas.
- **REMARK** Aiso known as *Magnolia obovata*.

The powerful scent of the flowers provides an easy clue to distinguishing this species. In Japan, the large leaves are used to wrap food.



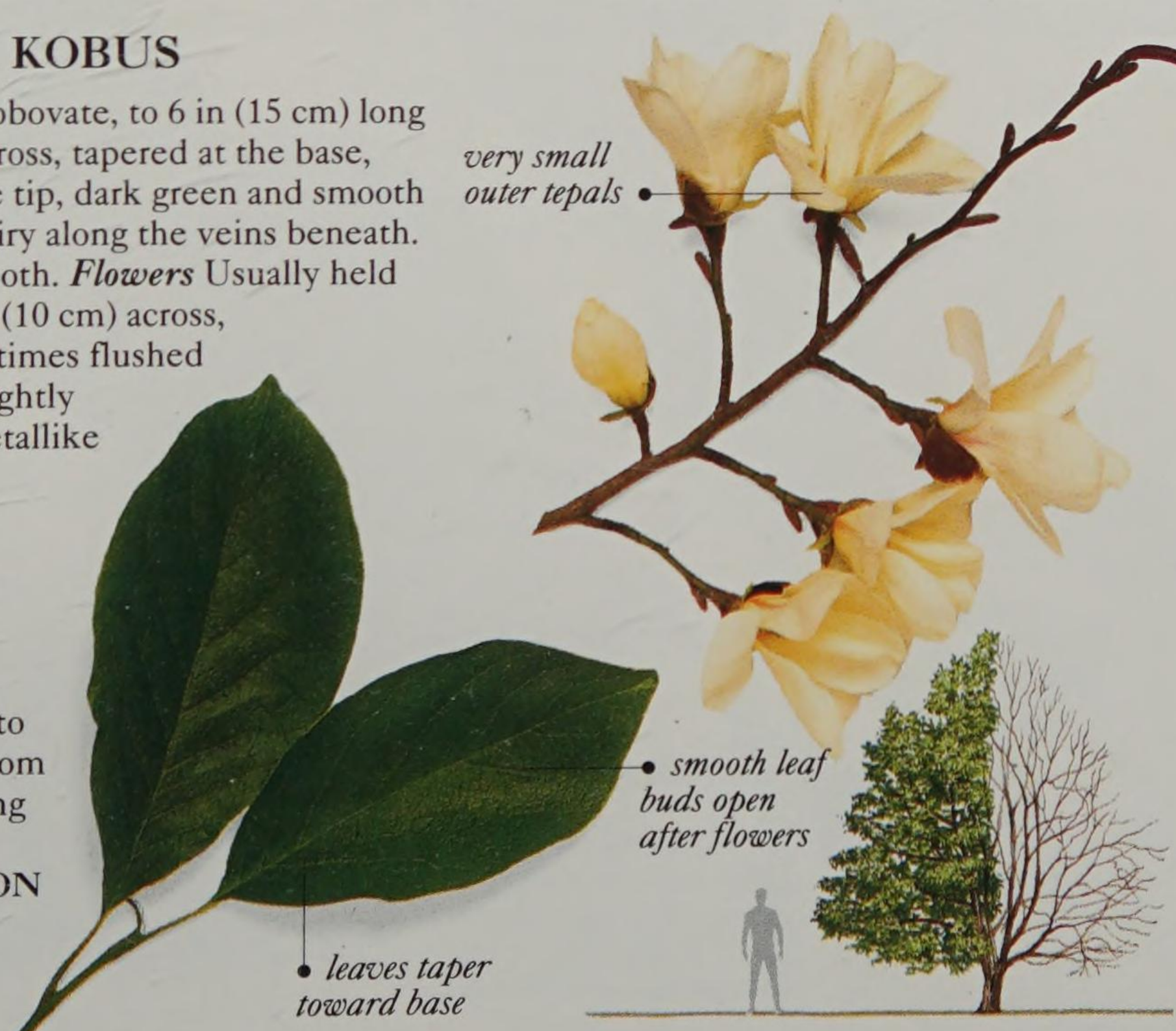
Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family MAGNOLIACEAE	Species *Magnolia kobus*	Author Candolle

MAGNOLIA KOBUS

Leaves Elliptic to obovate, to 6 in (15 cm) long and 3½ in (9 cm) across, tapered at the base, short-pointed at the tip, dark green and smooth above, paler and hairy along the veins beneath. ***Bark*** Gray and smooth. ***Flowers*** Usually held horizontally, to 4 in (10 cm) across, creamy white sometimes flushed pink at the base, slightly fragrant, with six petallike tepals and three smaller, sepallike tepals, opening in early spring before the leaves emerge. ***Fruit*** A cylindrical, pink to red cluster, to 4 in (10 cm) long, from which red seeds hang when ripe.

- **NATIVE REGION** Japan, S. Korea.
- **HABITAT** Mountain forests.



Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family MAGNOLIACEAE	Species *Magnolia* x *loebneri*	Author Kache

MAGNOLIA X LOEBNERI

Leaves Oblanceolate to elliptic, to 6 in (15 cm) long, glossy dark green to paler green, usually smooth. ***Bark*** Gray, smooth. ***Flowers*** Variable, upright to horizontal, to 6 in (15 cm) across, white to pink, with up to 16 or more tepals and three small, sepallike tepals, opening in early to mid-spring. ***Fruit*** A cylindrical, pinkish red cluster, to 4 in (10 cm) long.

• **NATIVE REGION**
Of garden origin.

• **REMARK** A group of hybrids between *Magnolia kobus* (see p.207) and the usually shrubby *Magnolia stellata*, first raised in Germany, with many selected forms that combine the best qualities of both parents. The starry flowers are inherited from the aptly named *M. stellata*.

◁ **'LEONARD MESSEL'**
Each lilac-pink flower of this form has about 12 drooping tepals.

slightly spreading flower buds
• borne upright

• numerous narrow tepals

'LEONARD MESSEL'

pink buds fade to white as flowers open •

broad, short-pointed leaves taper • toward base

• relatively narrow leaves

◁ **'MERRILL'**

◁ **'MERRILL'**

flowers open to • entirely white

flower buds • enclosed in silky scales

△ **'MERRILL'**
This vigorous plant bears large, white flowers, flushed faint pink at first. Each flower has up to 15 tepals.

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family MAGNOLIACEAE	Species *Magnolia macrophylla*	Author A. Michaux

LARGE-LEAVED MAGNOLIA

Leaves Very large and thin, broadly elliptic to oblong-ovate, to 24 in (60 cm) or longer and 12 in (30 cm) across, usually auricled at the base, green and smooth above, blue-green to blue-white and finely hairy beneath, in large whorls at the ends of stout shoots. ***Bark*** Pale gray and smooth. ***Flowers*** Very large and broadly cup-shaped, 12 in (30 cm) across, creamy white to yellowish, fragrant, with nine tepals, the inner tepals petal-like, usually marked with purple toward the base, the outer tepals sepallike, held upright, at the ends of the shoots in early to midsummer with the leaves. ***Fruit*** A rounded pink cluster, about 3 in (7.5 cm) long, from which red seeds hang when ripe.

• **NATIVE REGION**
S.E. United States.

• **HABITAT** Rich, moist woods.

• **REMARK** The enormous leaves and flowers of this species are among the largest of those of all deciduous trees that are native to temperate regions.

distinctively large leaves

outer tepals streaked green

bluish green leaf underside shows strong midrib

gray young shoot covered with soft hairs

twin auricles at leaf base

Height 50 ft (15 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family MAGNOLIACEAE	Species *Magnolia officinalis*	Author Rehder & Wilson

MAGNOLIA OFFICINALIS

Leaves Obovate, to 18 in (45 cm) long and 8 in (20 cm) across, tapered at the base, rounded to short-pointed at the tip, light green and smooth above, whitish and softly hairy when young beneath, carried in whorls at the ends of the shoots. ***Bark*** Pale gray and smooth. ***Flowers*** Cup- to saucer-shaped, 6 in (15 cm) across, creamy white, fragrant, the stamens with red filaments, at the ends of the shoots in late spring to early summer. ***Fruit*** An oblong, pinkish red cluster, to 6 in (15 cm) long, from which bright red seeds emerge and hang.

- **NATIVE REGION** C. China.
- **HABITAT** Now known only in cultivation.
- **REMARK** The form shown here, var. *biloba*, differs only in the large notch at the tip of the leaves. The bark was traditionally used for medicinal purposes. The practice of stripping it from the trees, thus killing them, may be responsible for the probable extinction of the species in the wild.

large fruits develop in autumn

△ VAR. BILOBA

VAR. BILOBA ▷

flowers soon fade and wither

large leaves whorled around flower

wavy leaf margin

Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

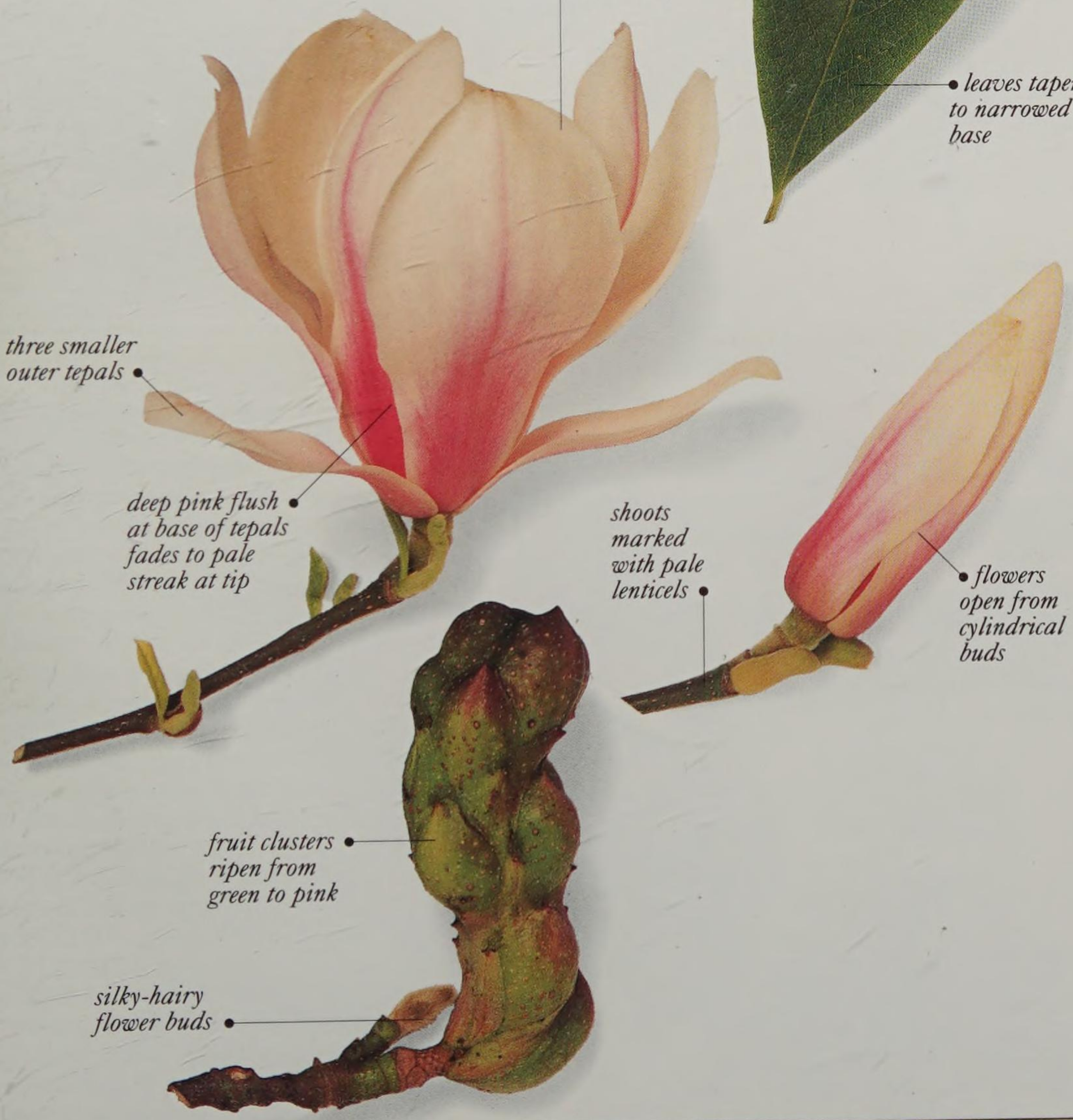
Family MAGNOLIACEAE	Species *Magnolia* x *soulangeana*	Author Soulange-Bodin

SAUCER MAGNOLIA

Leaves Elliptic to obovate, to 8 in (20 cm) long and 4¾ in (12 cm) across, tapered at the base, usually rounded at the tip, with a short point, dark green and nearly smooth above, paler and finely hairy beneath. ***Bark*** Gray and smooth. ***Flowers*** Variable, from goblet- to cup- or saucer-shaped, to 10 in (25 cm) across, with usually nine white to pink or deep purple-pink tepals, in spring to early summer from before to after the leaves emerge. ***Fruit*** A cylindrical cluster, to 4 in (10 cm) long, green ripening to pink.

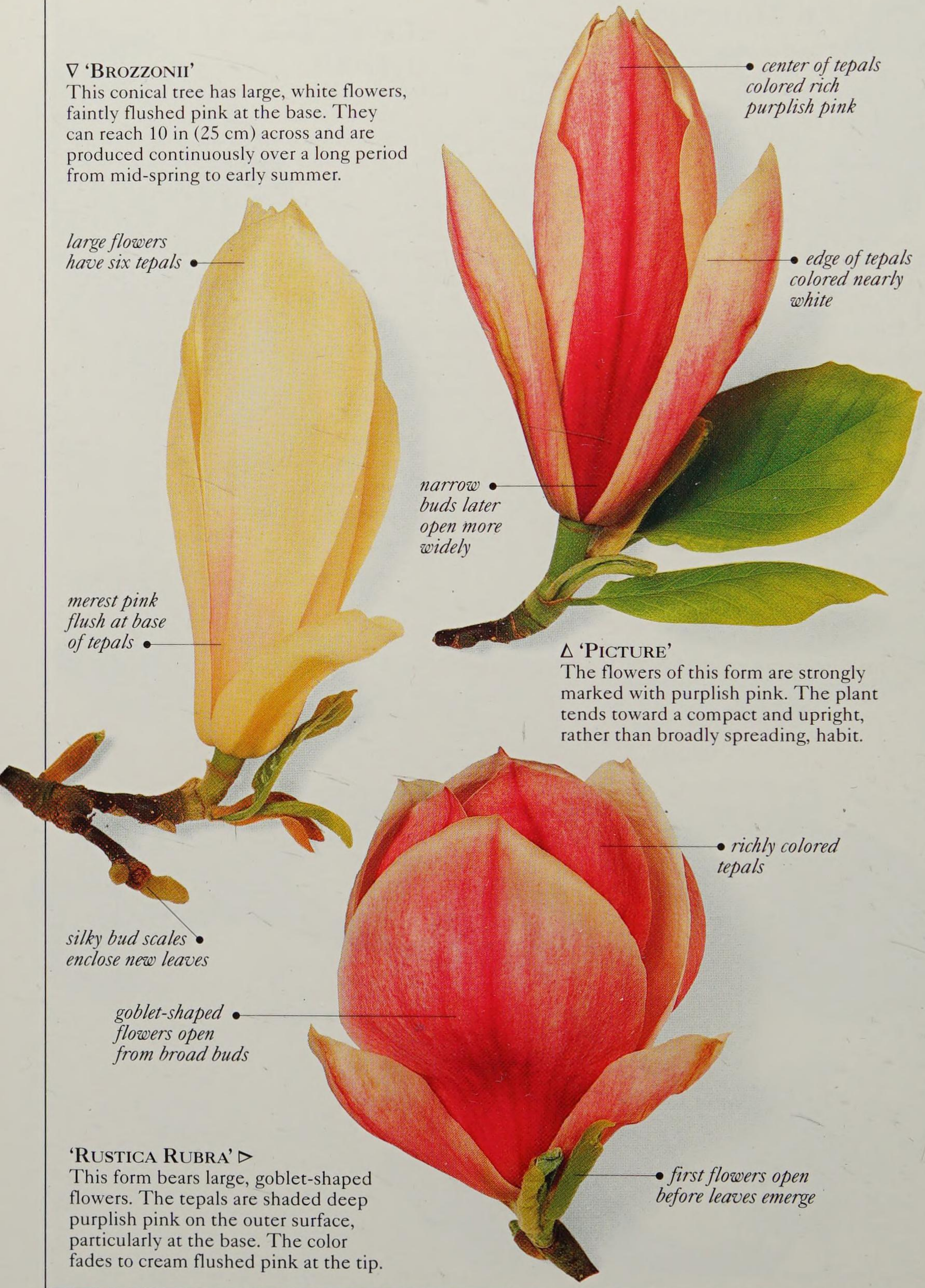
• **NATIVE REGION** Of garden origin.

• **REMARK** A hybrid between *Magnolia heptapeta* and *Magnolia quinquepeta*.



Height 30 ft (9 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family MAGNOLIACEAE	Species *Magnolia* x *soulangeana*	Author Soulange-Bodin



∇ 'BROZZONII'
This conical tree has large, white flowers, faintly flushed pink at the base. They can reach 10 in (25 cm) across and are produced continuously over a long period from mid-spring to early summer.

Δ 'PICTURE'
The flowers of this form are strongly marked with purplish pink. The plant tends toward a compact and upright, rather than broadly spreading, habit.

'RUSTICA RUBRA' ▷
This form bears large, goblet-shaped flowers. The tepals are shaded deep purplish pink on the outer surface, particularly at the base. The color fades to cream flushed pink at the tip.

Height 30 ft (9 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

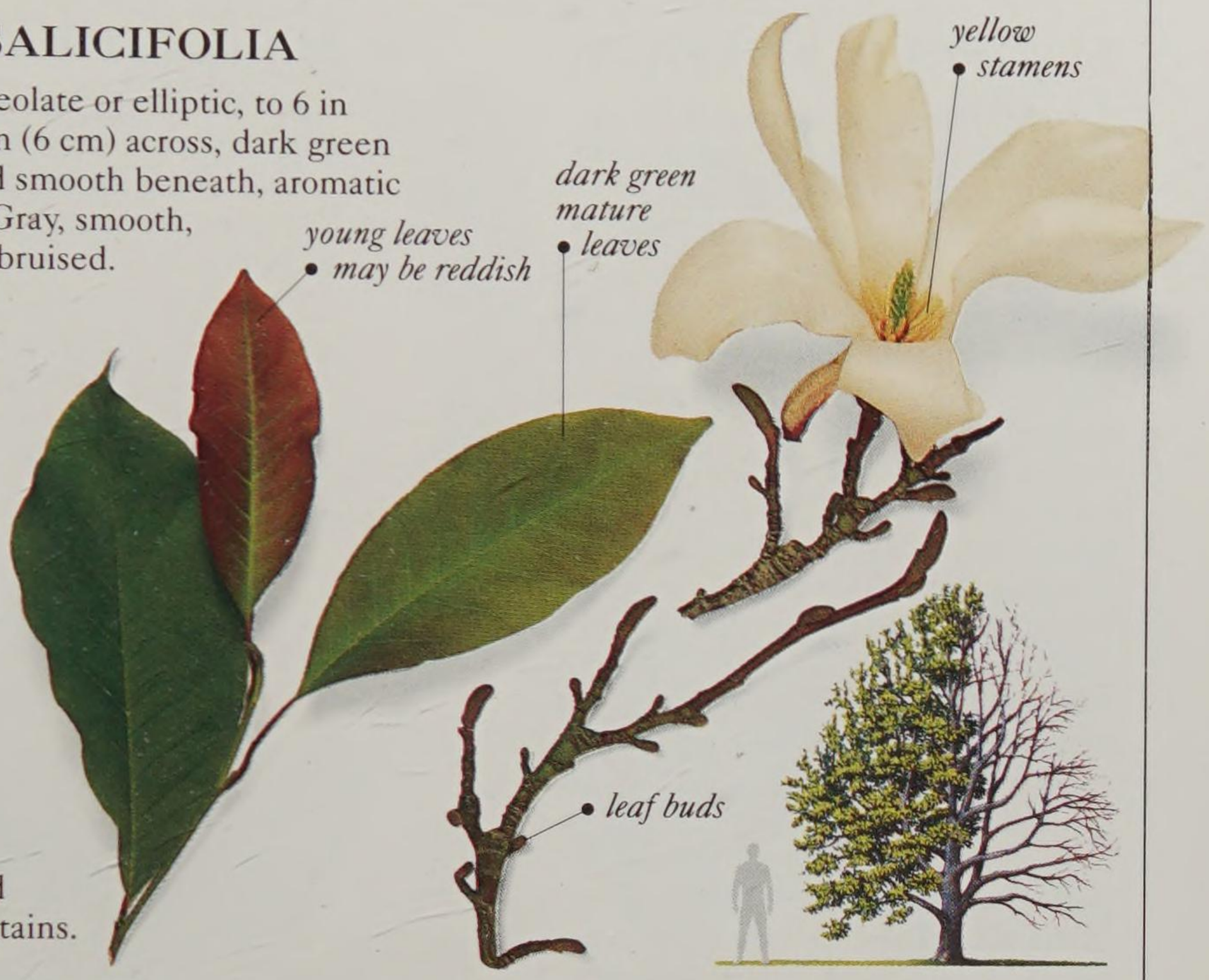
Family MAGNOLIACEAE	Species *Magnolia salicifolia*	Author (Sieb. & Zucc.) Maximowicz

MAGNOLIA SALICIFOLIA

Leaves Ovate to lanceolate or elliptic, to 6 in (15 cm) long and 2½ in (6 cm) across, dark green above, blue-green and smooth beneath, aromatic when crushed. ***Bark*** Gray, smooth, lemon-scented when bruised. ***Flowers*** Usually held horizontally, to 5 in (13 cm) across, white, fragrant, with six narrow tepals, the inner three petal-like, the outer three smaller and sepal-like, opening in early spring before leaves. ***Fruit*** A cylindrical pink cluster, to 3 in (7.5 cm) long.

• **NATIVE REGION** Japan.

• **HABITAT** Oak and beech woods in mountains.



Height 33 ft (10 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family MAGNOLIACEAE	Species *Magnolia tripetala*	Author Linnaeus

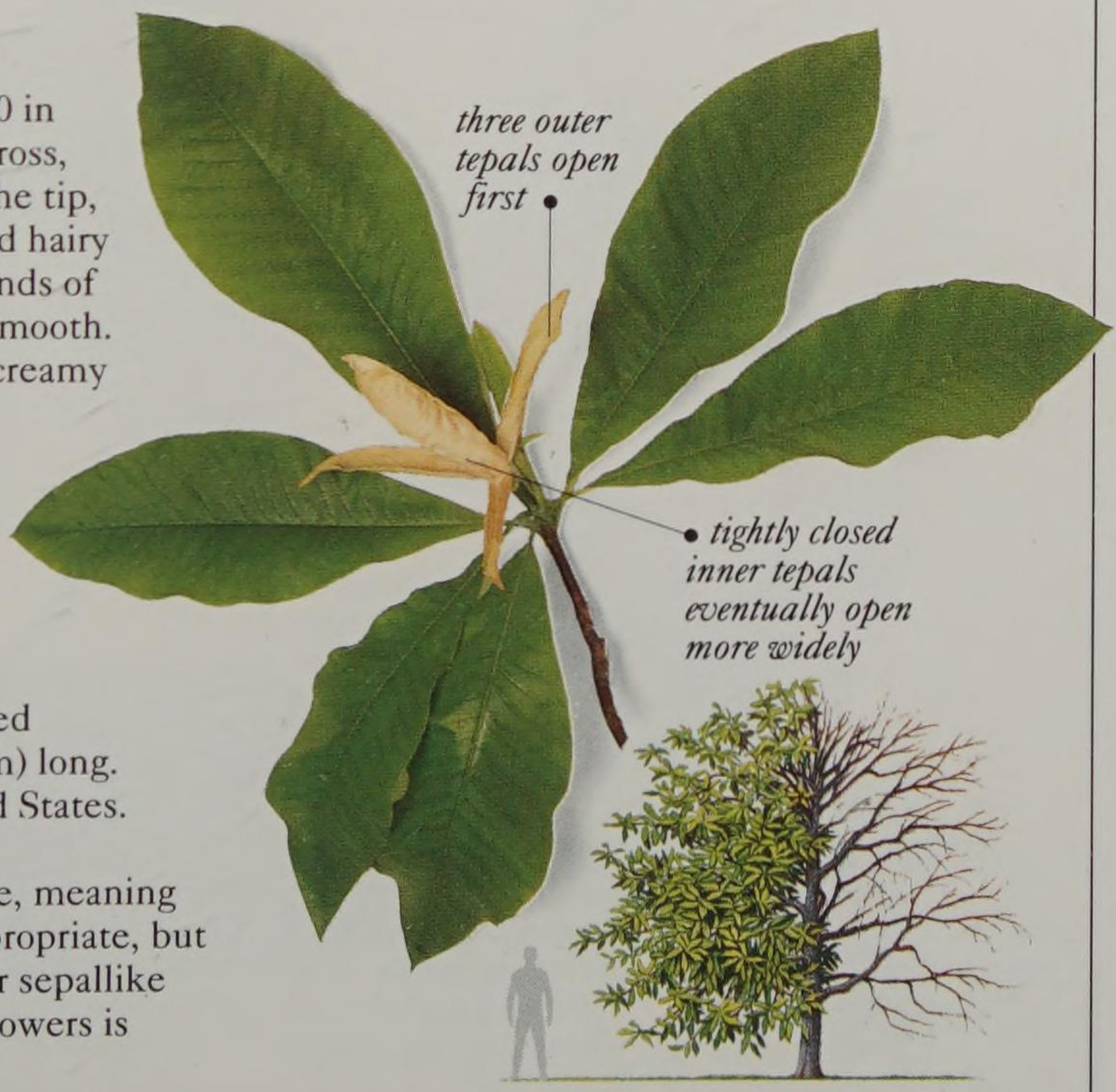
UMBRELLA TREE

Leaves Obovate to elliptic, to 20 in (50 cm) long and 8 in (20 cm) across, tapered at the base, pointed at the tip, dark green above, gray-green and hairy beneath, in large whorls at the ends of the shoots. ***Bark*** Pale gray and smooth. ***Flowers*** To 8 in (20 cm) across, creamy white, pungently fragrant, with usually 12 narrow spreading tepals, the three outer tepals opening first from distinctive, slender buds at the ends of the shoots in late spring to early summer with the young leaves. ***Fruit*** A cylindrical to cone-shaped pinkish red cluster, to 4 in (10 cm) long.

• **NATIVE REGION** E. United States.

• **HABITAT** Rich woods.

• **REMARK** The scientific name, meaning "three-petaled" may seem inappropriate, but probably refers to the three outer sepallike tepals. The strong scent of the flowers is unpleasant to some people.



Height 40 ft (12 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

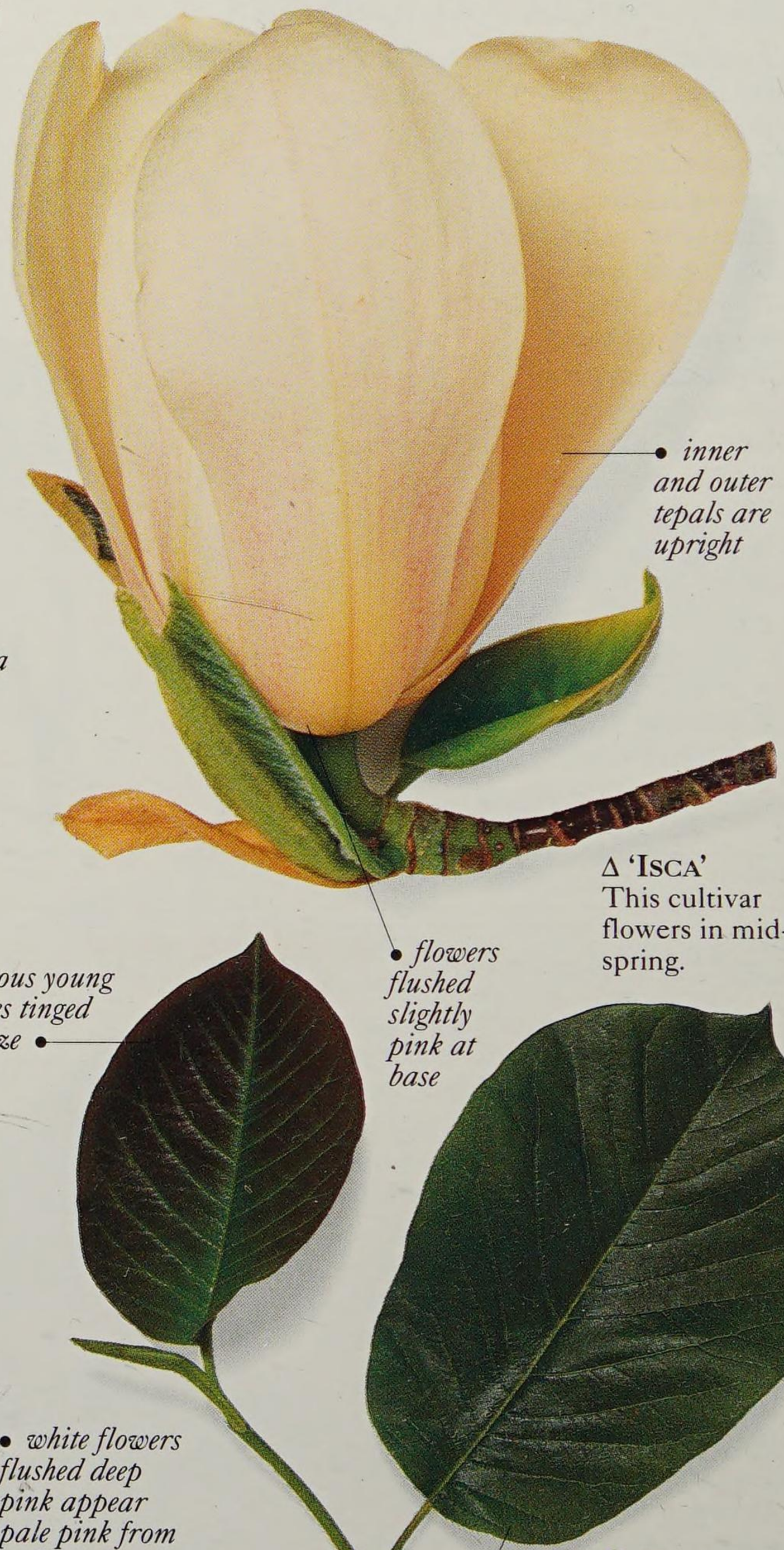
Family MAGNOLIACEAE	Species *Magnolia x veitchii*	Author Bean

MAGNOLIA X VEITCHII

Leaves Obovate to oblong, to 12 in (30 cm) long and 6 in (15 cm) across, short-pointed at the tip, bronze-purple at first becoming dark green and smooth above, downy at least on the veins beneath. ***Bark*** Gray and smooth. ***Flowers*** Vase-shaped, to 6 in (15 cm) long, white to pink, fragrant, with usually nine tepals, opening in mid-spring usually before the leaves. ***Fruit*** A cylindrical cluster to 4 in (10 cm) long, pinkish green ripening to purple-brown.

• **NATIVE REGION**
Of garden origin.

• **REMARK** One of a number of hybrids between the often shrubby yulan *(Magnolia denudata)* and *Magnolia campbellii* (see p.203). These vigorous trees owe their large size to the latter parent, which can reach 100 ft (30 m) in the wild. They are very attractive plants, usually producing abundant flowers and pretty young foliage.



Δ **'ISCA'**
This cultivar flowers in mid-spring.

Δ **'PETER VEITCH'**
The goblet-shaped, soft pink blooms of this hardy magnolia appear in mid-spring before the leaves. Flowers are produced even on young plants.

Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family MAGNOLIACEAE	Species *Magnolia* 'Wada's Memory'	Author None

MAGNOLIA 'WADA'S MEMORY'

Leaves Obovate to narrowly ovate, to 7 in (17.5 cm) long, tapered at the base, abruptly pointed, red-purple becoming glossy dark green above, blue-green beneath, smooth on both sides. ***Bark*** Gray, smooth. ***Flowers*** Held horizontally, 6 in (15 cm) across, creamy white becoming white, fragrant, the tepals soon drooping, opening from felted buds. ***Fruit*** A cylindrical, pink to red cluster, to 4 in (10 cm) long, not usually produced.

• **NATIVE REGION** Of garden origin.

• **REMARK** Probably a hybrid between *Magnolia kobus* (see p.207) and *Magnolia salicifolia* (see p.213), which originated in Japan. It is named after the Japanese nurseryman, Koichiro Wada.

tepals soon flop as flower buds open

much smaller tepals at base of flower

young leaves colored reddish purple

silky scales enclose flower bud

young leaves emerge just after first flowers

leaves mature to olive green

Height 30 ft (9 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

MALVACEAE

WITH MORE THAN 100 GENERA and 1,500 species, the mallow family is found worldwide, except in the very coldest parts. The plants are deciduous and evergreen trees and shrubs, as well as herbaceous. The alternate leaves are often palmately lobed. Flowers vary from large and showy to very small.

Family MALVACEAE	Species *Hoheria glabrata*	Author Sprague & Summerhayes

MOUNTAIN RIBBONWOOD

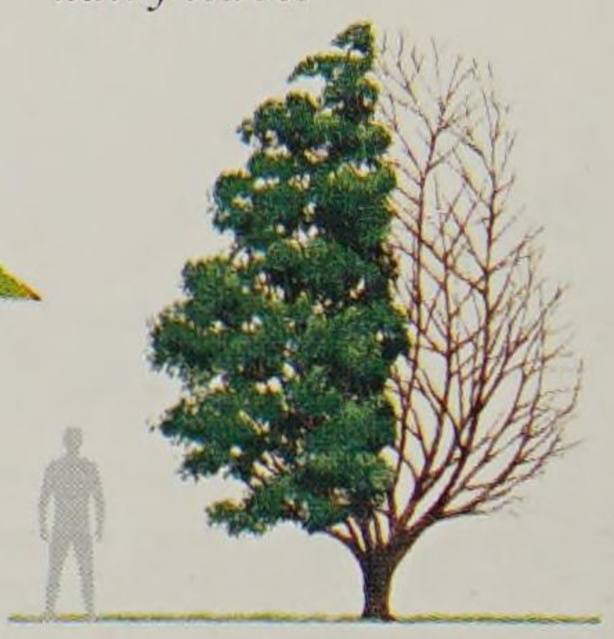
Leaves Ovate, to 4 in (10 cm) long and 2 in (5 cm) across, heart-shaped at the base, toothed, dark green above, smooth or nearly so on both sides, turning yellow in autumn. ***Bark*** Gray, smooth. ***Flowers*** To 1½ in (4 cm) across, white, with five petals and yellow anthers, in clusters in the leaf axils in summer. ***Fruit*** Small, brown.

• **NATIVE REGION** New Zealand.

• **HABITAT** Forests and scrubland.

HOHERIA ▷ GLABRATA

HOHERIA LYALLII ▷ This similar species is also called mountain ribbonwood. It reaches only about 20 ft (6 m).



Height 33 ft (10 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family MALVACEAE	Species *Hoheria sexstylosa*	Author Colenso

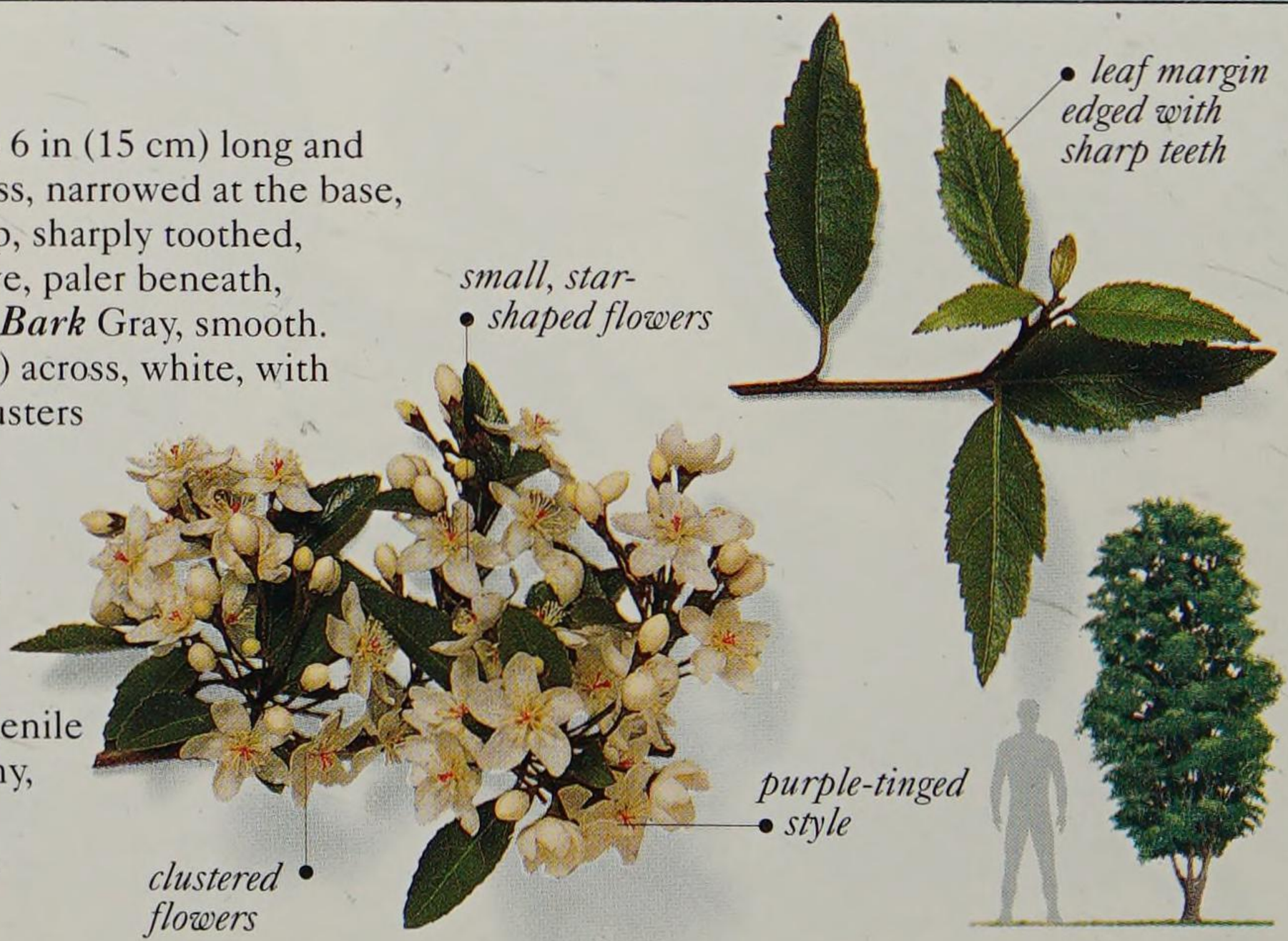
LACEBARK

Leaves Lanceolate, to 6 in (15 cm) long and 2 in (5 cm) or less across, narrowed at the base, taper-pointed at the tip, sharply toothed, glossy dark green above, paler beneath, smooth on both sides. ***Bark*** Gray, smooth. ***Flowers*** To ¾ in (2 cm) across, white, with five petals, in small clusters in the leaf axils in late summer. ***Fruit*** Small and brown.

• **NATIVE REGION** New Zealand.

• **HABITAT** Forests.

• **REMARK** In its juvenile stage, the plant is bushy, and has more deeply toothed, or sometimes even lobed, leaves.



Height 26 ft (8 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

MELIACEAE

OCCURRING IN TEMPERATE regions of east Asia, this largely tropical and subtropical family is composed of some 50 genera and nearly 600 species. The plants, which are evergreen and deciduous trees and shrubs, have leaves that are most often pinnate, arranged alternately. The flowers are usually small, frequently borne in large clusters. The fruit is a woody capsule. Many trees that belong to Meliaceae have an important commercial value for their timber: several of the species produce the hardwood mahogany.

Family MELIACEAE	Species *Cedrela sinensis*	Author Jussieu

CEDRELA SINENSIS

Leaves Pinnate, to 24 in (60 cm) long, with up to 26 oblong-lanceolate, taper-pointed, remotely toothed leaflets, to 6 in (15 cm) long, the terminal leaflet often missing, bronze to pinkish and downy when young becoming dark green and smooth or nearly so, tinged yellow in autumn, smelling of onions when crushed. ***Bark*** Brown, peeling in long strips. ***Flowers*** Small and white, fragrant, in large, drooping panicles 12 in (30 cm) or more long, from the ends of the shoots in midsummer. ***Fruit*** A woody, brown capsule, 1¼ in (3 cm) long.

- **NATIVE REGION** China.
- **HABITAT** Woods.
- **REMARK** Also known as *Toona sinensis*.

Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

MORACEAE

THIS LARGE FAMILY includes the figs *(Ficus*, see p.219) and mulberries *(Morus*, see p.220). Its 50 genera and some 1,200 species of deciduous and evergreen trees, shrubs, and climbing and herbaceous plants are distributed worldwide. The leaves are usually alternate and simple, and, occasionally, lobed. Male and female flowers are borne separately, in small clusters.

Family MORACEAE	Species *Broussonetia papyrifera*	Author (Linnaeus) Ventenat

PAPER MULBERRY

Leaves Ovate to broadly ovate, to 8 in (20 cm) long and 6 in (15 cm) across, sometimes lobed, coarsely toothed, purplish at first becoming matt dark green, roughly hairy above, softly hairy beneath. ***Bark*** Gray-brown, shallowly fissured. ***Flowers*** Males and females both small, males white, in stout, drooping catkins, females green, with slender, purple, protruding stigmas, borne in dense, rounded heads on separate plants in late spring to early summer. ***Fruit*** Red, protruding from a rounded cluster, ¾ in (2 cm) across.

- **NATIVE REGION** China, Japan.
- **HABITAT** Sunny, fertile situations.
- **REMARK** In Japan, the bark is traditionally used to make paper.

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family MORACEAE	Species *Ficus carica*	Author Linnaeus

COMMON FIG

Leaves Rounded in outline, to 12 in (30 cm) long and across, deeply cut into three to five lobes, heart-shaped at the base, toothed, glossy green above, rough with hairs on both sides, turning yellow in autumn. ***Bark*** Gray and smooth. ***Flowers*** Males and females both very small, borne inconspicuously inside a fleshy green receptacle, on separate plants in late spring. ***Fruit*** Numerous small seeds borne inside a receptacle, the whole green ripening to brown or purple, forming the edible fig.

- **NATIVE REGION** S.W. Asia.
- **HABITAT** Broadleaf forests.
- **REMARK** This species is commonly naturalized in the Mediterranean. It favors rocky places, including old walls. Plants are fertilized by female wasps, which take pollen from the tree in which they hatched to one in which they lay their eggs. Most cultivated plants produce fruit without pollination.

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family MORACEAE	Species *Maclura pomifera*	Author (Rafinesque) Schneider

OSAGE ORANGE

Leaves Ovate, to 4 in (10 cm) long and 2 in (5 cm) across, untoothed, glossy bright green above, smooth, turning yellow in autumn. ***Bark*** Orange-brown, fissured. ***Flowers*** Males and females small, yellow-green, in clusters ⅜ in (1 cm) long, on separate plants in early summer. ***Fruit*** A yellow-green cluster, to 4 in (10 cm) across.

• **NATIVE REGION**
C. and S. United States.

• **HABITAT** Rich, moist soil.

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family MORACEAE	Species *Morus alba*	Author Linnaeus

WHITE MULBERRY

Leaves Ovate to rounded, to 8 in (20 cm) long and 4¾ in (12 cm) across, toothed, bright green above, turning yellow in autumn. ***Bark*** Orange-brown. ***Flowers*** Males and females green, in clusters about ⅜ in (1 cm) long, on the same or separate plants in early summer. ***Fruit*** A white to pink or red cluster, to 1 in (2.5 cm) long.

• **NATIVE REGION**
N. China.

• **HABITAT** Hill slopes.

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family MORACEAE	Species *Morus nigra*	Author Linnaeus

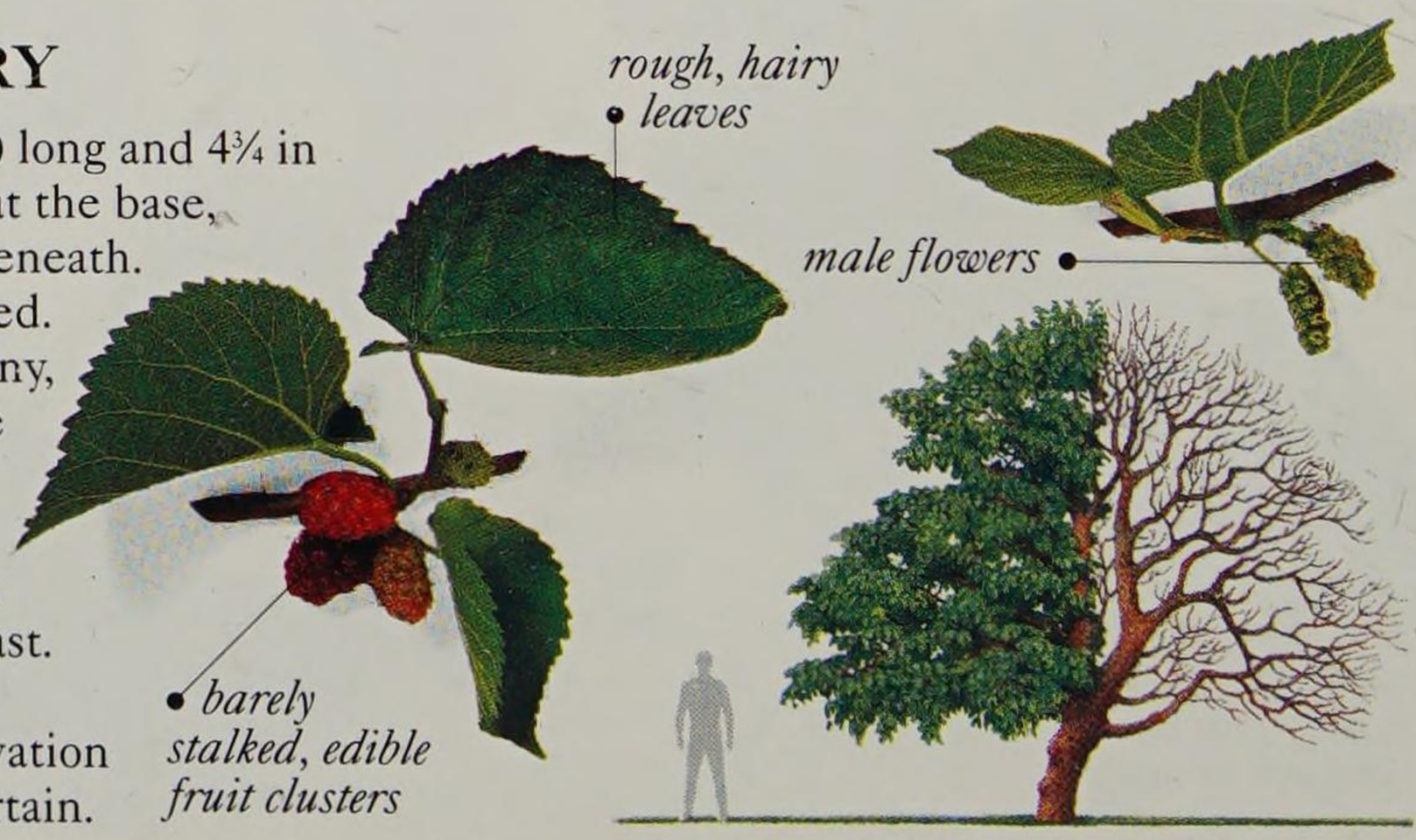
BLACK MULBERRY

Leaves Ovate, to 6 in (15 cm) long and 4¾ in (12 cm) across, heart-shaped at the base, toothed, green above, hairy beneath. ***Bark*** Orange-brown and ridged. ***Flowers*** Males and females tiny, green, in small clusters on the same or separate plants in early summer. ***Fruit*** A dark red cluster, 1 in (2.5 cm) long.

• **NATIVE REGION** Far East.

• **HABITAT** Not known.

• **REMARK** Extensive cultivation makes its precise origin uncertain.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

MYRTACEAE

THIS LARGE FAMILY is distributed most widely in the southern hemisphere. Despite the fact that it extends to temperate regions of the northern hemisphere, it does not grow wild in North America, and is represented in Europe only by the myrtle *(Myrtus communis)*. It contains nearly 4,000 species of usually evergreen and frequently aromatic, trees and shrubs, in over 100 genera. The leaves are often opposite. The flowers usually have four or five petals and numerous stamens. In eucalyptus species, the petals form a cap over the flower, which falls as the flower opens.

Family MYRTACEAE	Species *Callistemon* species	Author None

CALLISTEMONS

The callistemons, or bottlebrushes, are all native to Australia, and can be found growing usually in moist habitats. Some make small trees, reaching about 33 ft (10 cm), for example *C. salignus* and *C. viminalis*, although most are shrubby. These evergreen plants have usually narrow, pointed leaves, often colored bronze or red when young. The flowers have very small petals, but their numerous long stamens, which range in color from creamy white or yellow to red, pink, or purplish, radiate around the stem, forming dense spikes, and giving the flower clusters their characteristic appearance.

△ CALLISTEMON SUBULATUS
This native of S.E. Australia has slender, pointed leaves, covered in silky hairs when young. The large flower clusters, which have numerous crimson stamens, open in summer.

△ CALLISTEMON VIRIDIFLORUS
The green bottlebrush is a native of Tasmania, where it is found in moist places in the hills. The flowerheads consist of dense clusters of pale yellow-green stamens. They are produced in the summer months.

Height To 33 ft (10 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family MYRTACEAE	Species *Eucalyptus coccifera*	Author J.D. Hooker

MOUNT WELLINGTON PEPPERMINT

Leaves Juvenile leaves rounded, usually glaucous, unstalked, adult leaves lanceolate, to 2 in (5 cm) long and ¾ in (2 cm) across, with a hooked tip, green to blue-green, smooth on both sides, aromatic, on often bloomy shoots. ***Bark*** Gray and white, smooth, peeling in long strips; creamy white when freshly exposed. ***Flowers*** White, with numerous stamens, borne in clusters of three to seven in the leaf axils in early summer. ***Fruit*** Resembling an inverted cone, small and woody, ⅜ in (1 cm) long.

- **NATIVE REGION** Tasmania.
- **HABITAT** Mountains.
- **REMARK** Also known as Tasmanian snow gum. Juvenile leaves are opposite, adult leaves alternate: plants often bear both stages together. On mature plants, juvenile foliage is produced on shoots from the base of the trunk.

Height 80 ft (25 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

Family MYRTACEAE	Species *Eucalyptus cordata*	Author Labillardière

SILVER GUM

Leaves Nearly rounded to ovate, to 4 in (10 cm) long and 2½ in (6 cm) across, with rounded, shallow teeth, blue-gray and bloomy on both sides, aromatic, unstalked, lying close to square, white-bloomed shoots. ***Bark*** Smooth and white, with gray and green patches, peeling in long ribbons. ***Flowers*** Creamy white, with numerous stamens, in clusters of three in the leaf axils, opening from bloomy buds on a flattened and bloomy common stalk in winter. ***Fruit*** A hemispherical, small, bloomy capsule, ⅜ in (1 cm) long.

- **NATIVE REGION** Tasmania.
- **HABITAT** Woods in hills and mountains.
- **REMARK** Juvenile and adult leaves are similar: the foliage does not change in shape or type as the tree matures, unlike that of most eucalyptus species.

Height 50 ft (15 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family MYRTACEAE	Species *Eucalyptus dalrympleana*	Author Maiden

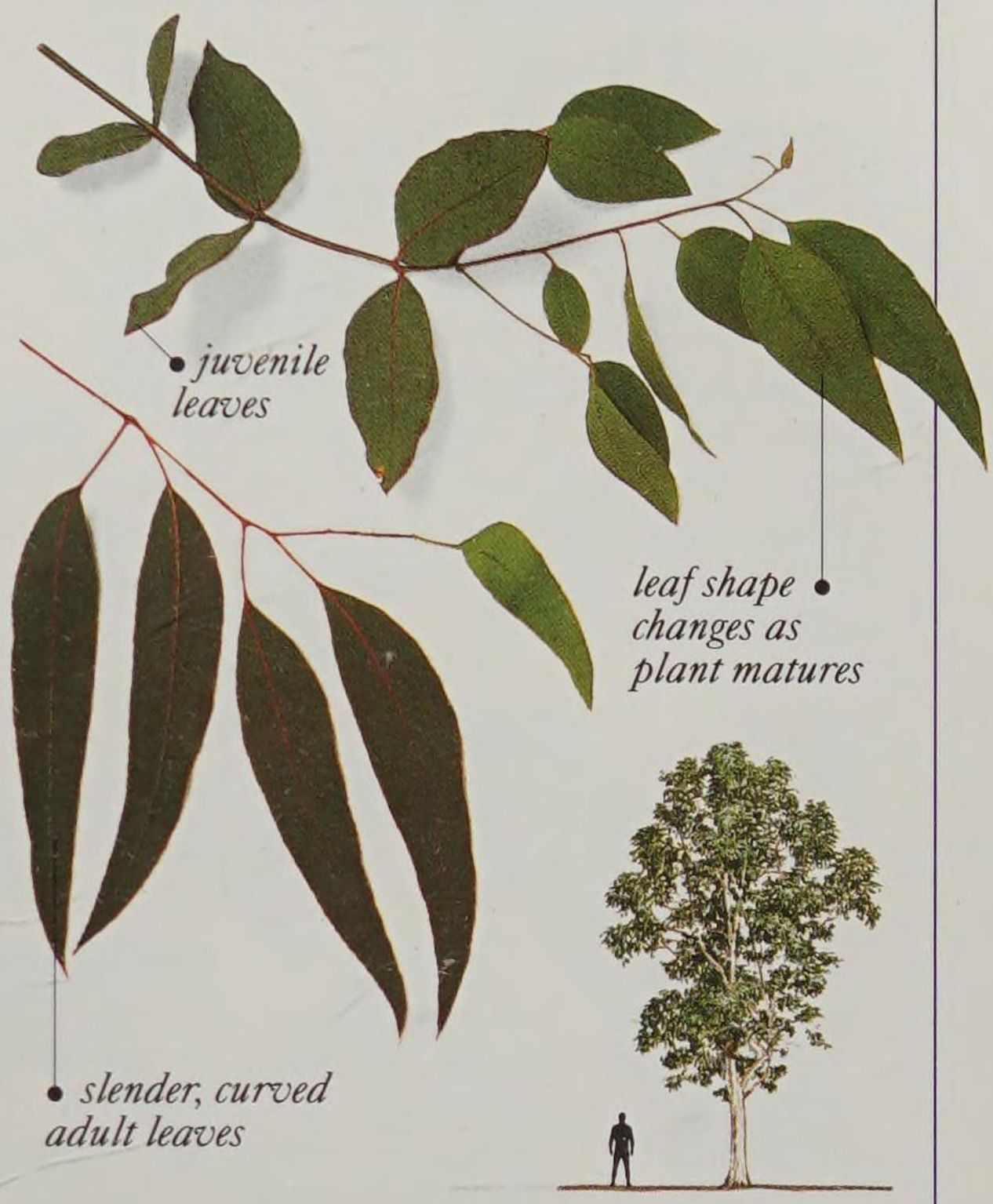
MOUNTAIN GUM

Leaves Juvenile leaves rounded, unstalked, adult leaves lanceolate, to 7 in (17.5 cm) long and 1¼ in (3 cm) across, tapered to a fine point, bronze when young becoming blue-green and smooth on both sides. ***Bark*** Gray-brown and smooth, peeling in large flakes; creamy white when freshly exposed. ***Flowers*** White, with numerous stamens, in clusters of three in the leaf axils in late summer. ***Fruit*** Hemispherical, small, woody, ⅜ in (1 cm) long.

• **NATIVE REGION**
S.E. Australia, Tasmania.

• **HABITAT**
Mountain slopes.

• **REMARK** Juvenile leaves are opposite, adult leaves alternate: plants often bear both stages together.



Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family MYRTACEAE	Species *Eucalyptus gunnii*	Author J.D. Hooker

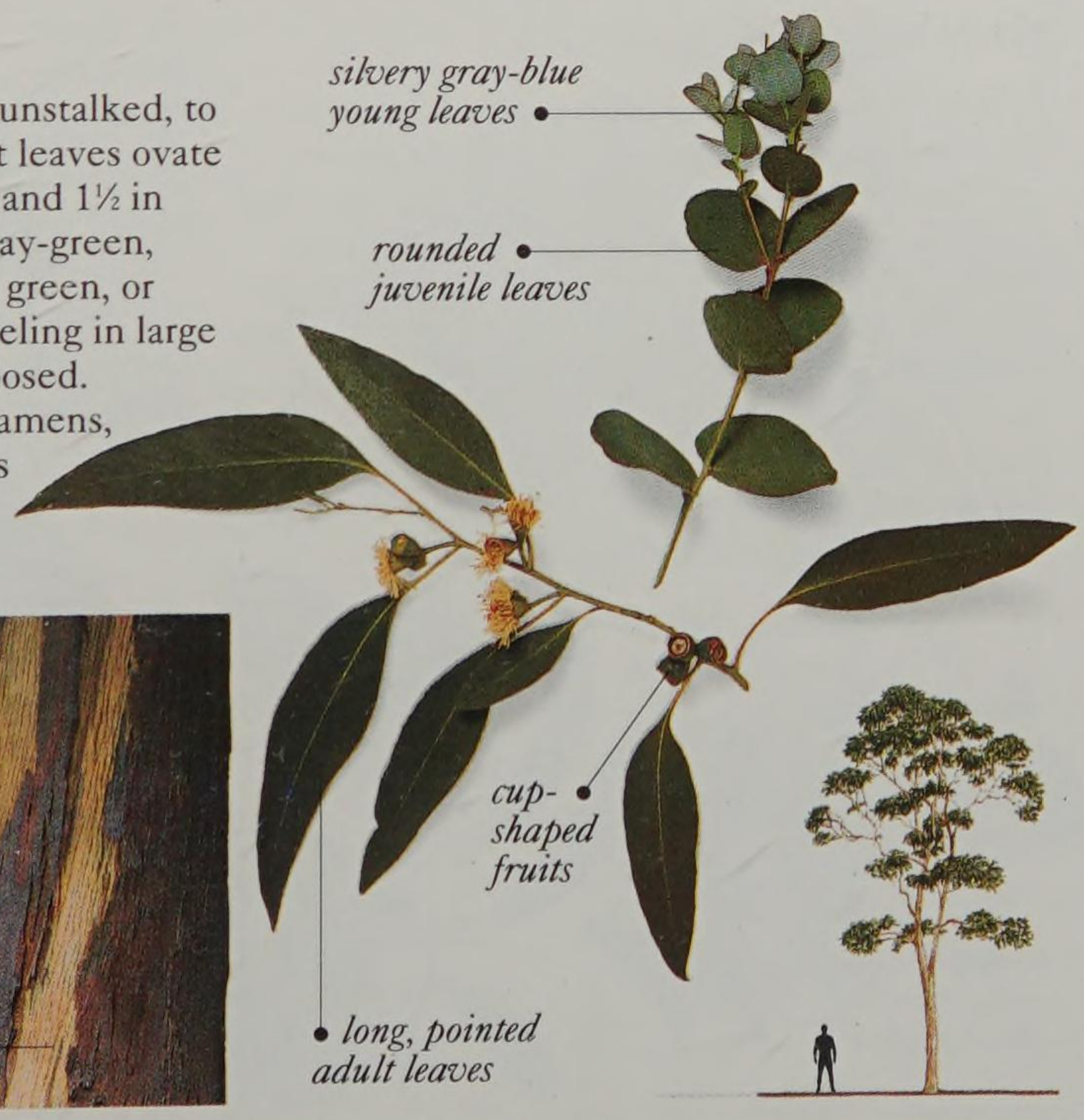
CIDER GUM

Leaves Juvenile leaves rounded, unstalked, to 1½ in (4 cm) long, gray-blue, adult leaves ovate to lanceolate, to 4 in (10 cm) long and 1½ in (4 cm) across, silvery becoming gray-green, smooth on both sides. ***Bark*** Gray, green, or orange, rough at the very base, peeling in large patches; creamy when freshly exposed. ***Flowers*** White, with numerous stamens, in clusters of three in the leaf axils in late spring to summer. ***Fruit*** Cup-shaped, green or bloomy, 3/16 in (5 mm) long.

• **NATIVE REGION**
Tasmania.

• **HABITAT** Alpine woods.

• **REMARK** Juvenile leaves are opposite, adult leaves alternate: plants often bear both stages together.



Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

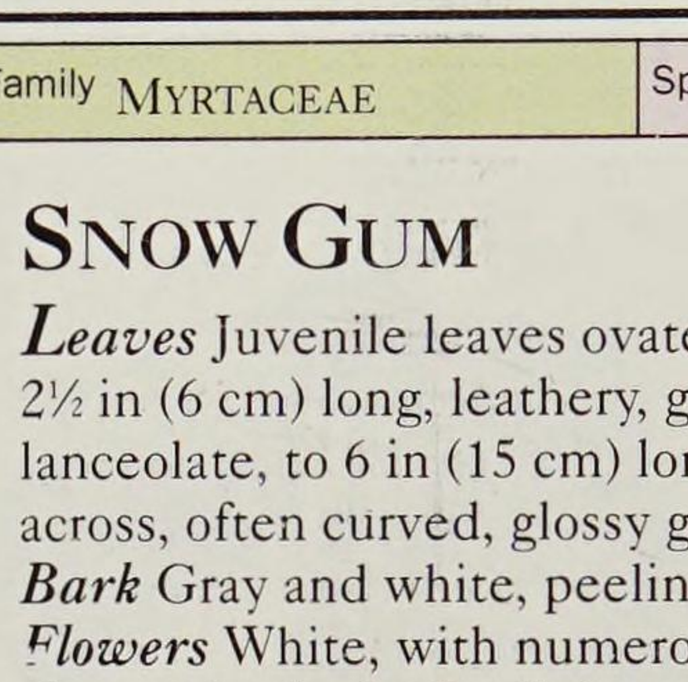
Family MYRTACEAE	Species *Eucalyptus pauciflora*	Author Siebold ex Sprengel

SNOW GUM

Leaves Juvenile leaves ovate to rounded, to 2½ in (6 cm) long, leathery, gray, adult leaves lanceolate, to 6 in (15 cm) long and 1½ in (4 cm) across, often curved, glossy green and smooth. ***Bark*** Gray and white, peeling in large flakes. ***Flowers*** White, with numerous stamens, in clusters in the leaf axils in summer. ***Fruit*** Rounded, woody, ¼ in (6 mm) long.

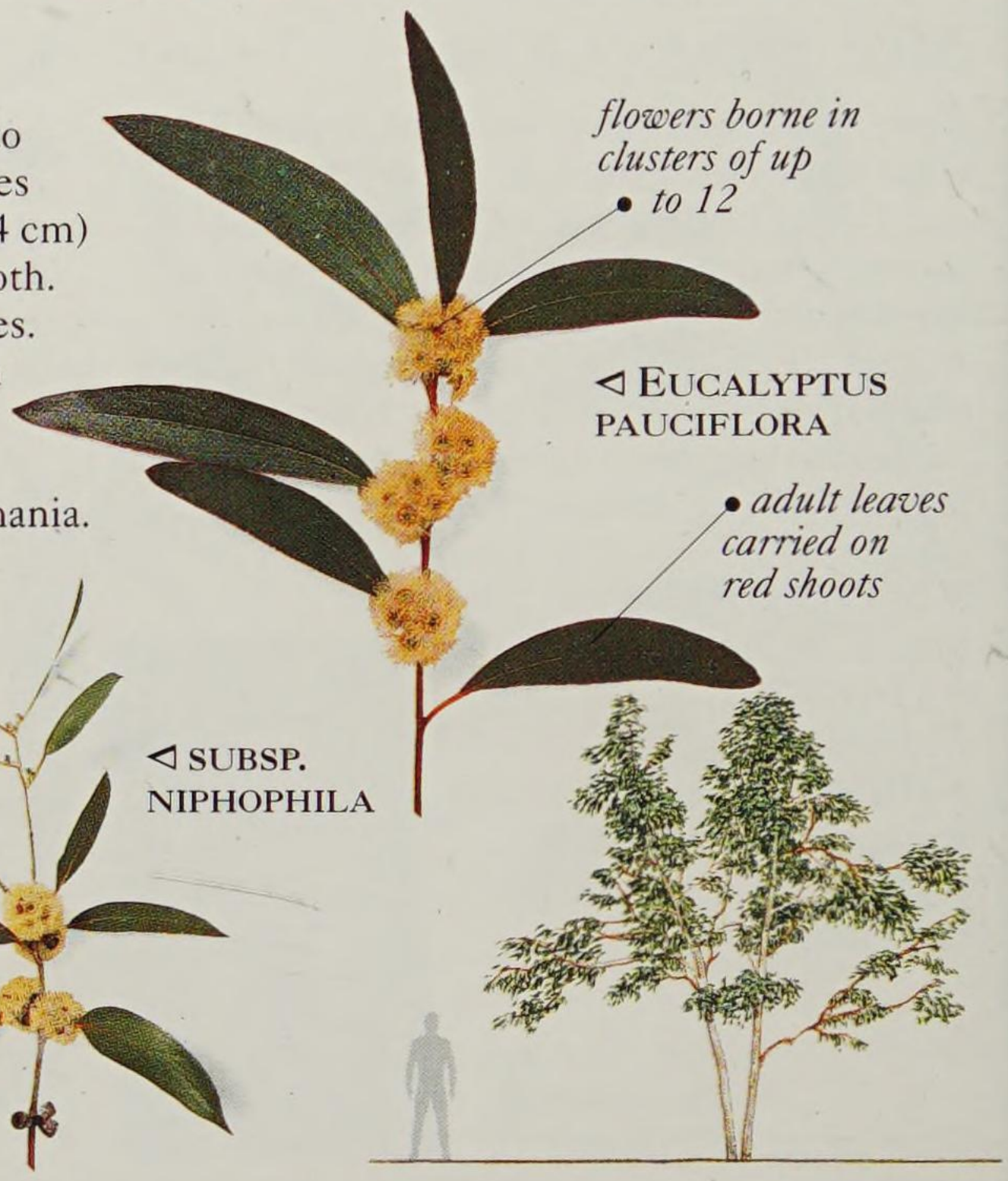
• **NATIVE REGION** S.E. Australia, Tasmania.

• **HABITAT** From sea level to the tree line.



◁ **SUBSP. NIPHOPHILA** This high mountain form is often shrubby.

◁ **SUBSP. NIPHOPHILA**



◁ **EUCALYPTUS PAUCIFLORA**

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

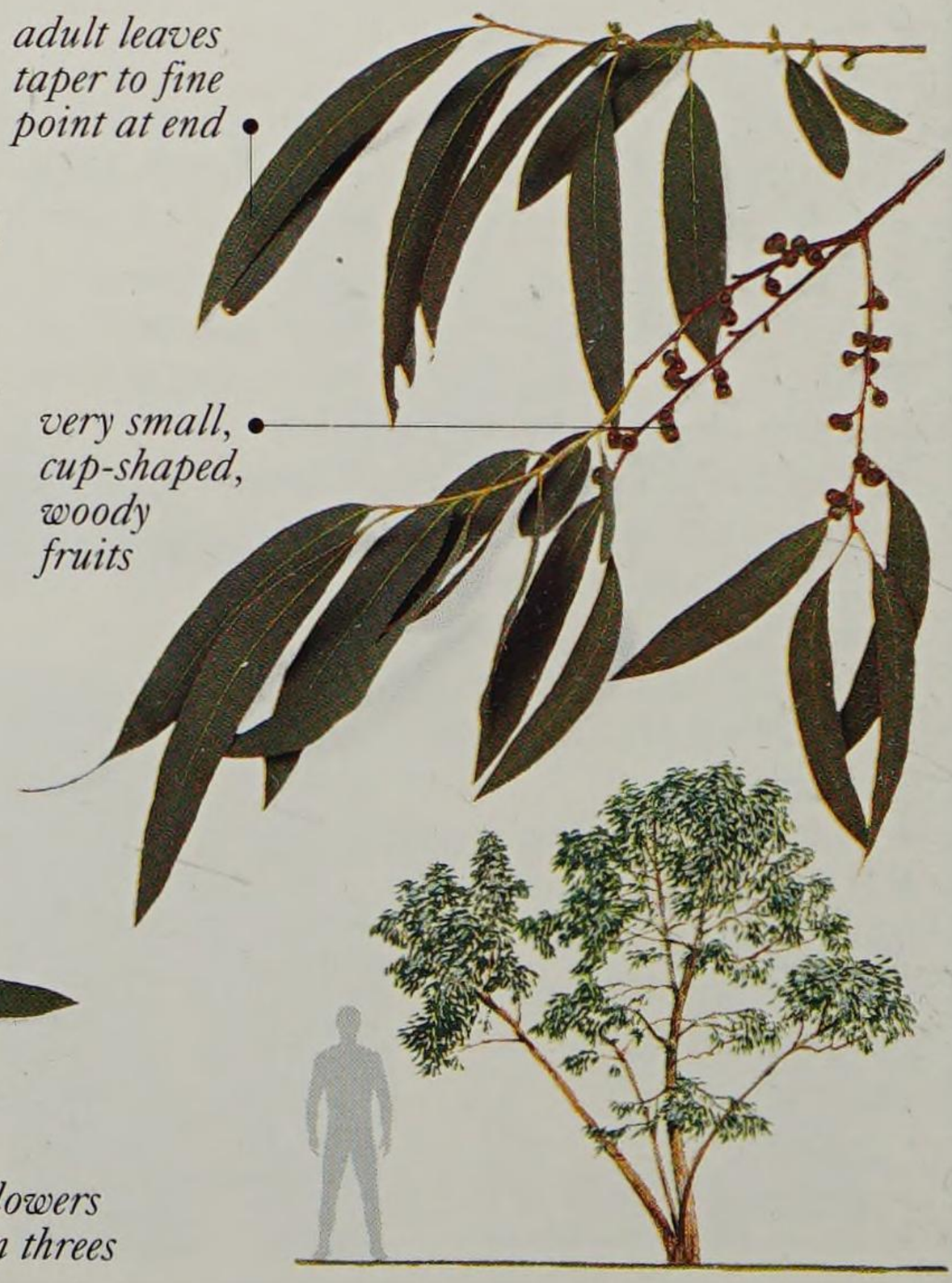
Family MYRTACEAE	Species *Eucalyptus perriniana*	Author Mueller ex Rodway

SPINNING GUM

Leaves Juvenile leaves blue-gray, joined at the base forming a circular disk around the shoot, adult leaves lanceolate, to 4¾ in (12 cm) long and 1 in (2.5 cm) across, often purple when young becoming deep blue-green and smooth on both sides, pendulous. ***Bark*** Gray and brown, peeling. ***Flowers*** White, with numerous stamens, in clusters in the leaf axils in late summer. ***Fruit*** Small, woody, 3/16 in (5 mm) long.

• **NATIVE REGION** S.E. Australia, Tasmania.

• **HABITAT** Mountains, on moist soil.



Height 23 ft (7 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

Family MYRTACEAE	Species *Eucalyptus urnigera*	Author J.D. Hooker

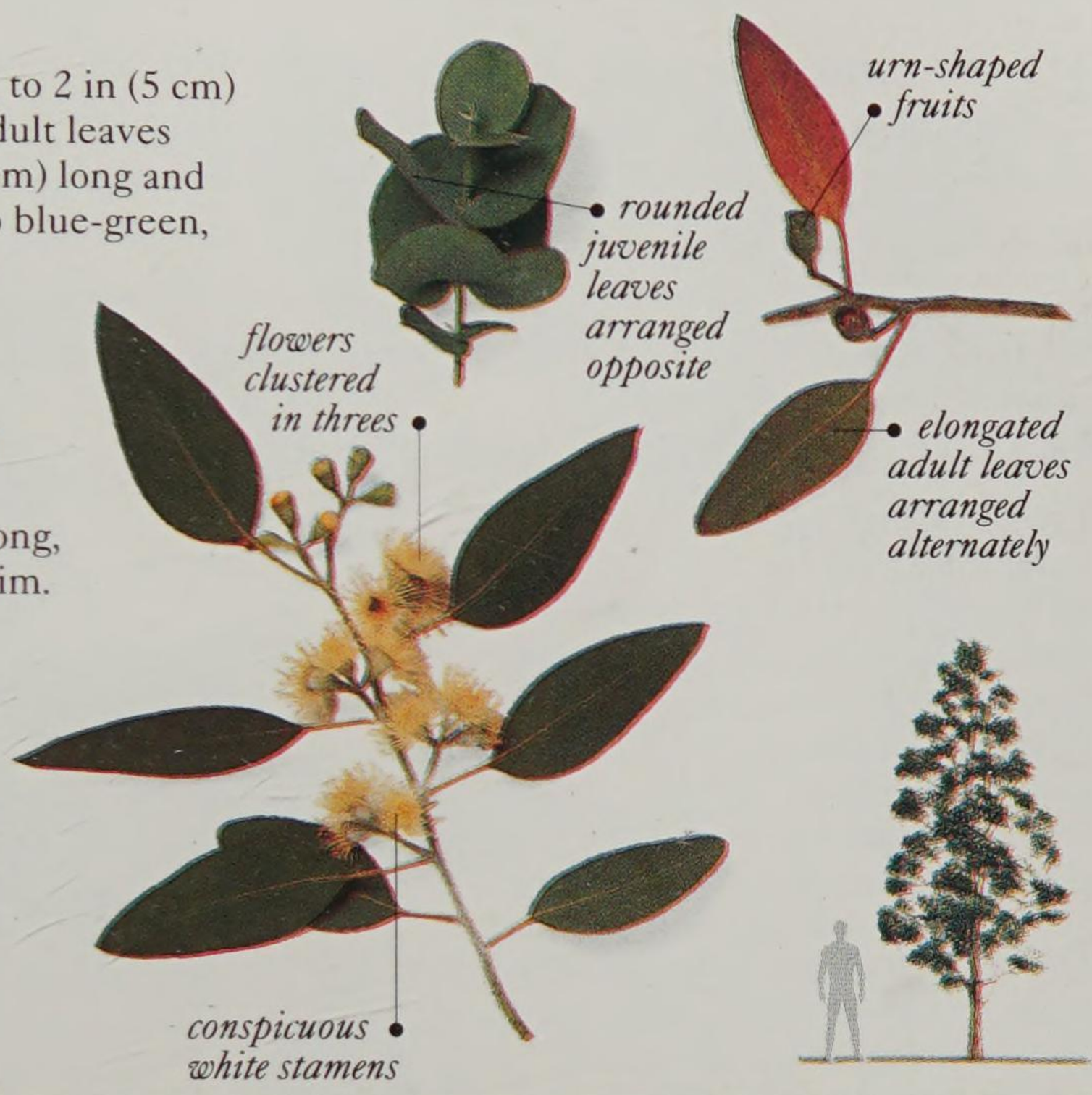
URN GUM

Leaves Juvenile leaves rounded, to 2 in (5 cm) long, with a blue-white bloom, adult leaves ovate to lanceolate, to 4¾ in (12 cm) long and 2 in (5 cm) across, glossy green to blue-green, smooth on both sides. ***Bark*** Pale gray to creamy white or orange-yellow, peeling vertically in long ribbons. ***Flowers*** White, with numerous stamens, in clusters of three in the leaf axils in spring. ***Fruit*** Urn-shaped, ¼ in (6 mm) long, distinctly constricted below the rim.

• **NATIVE REGION** S.E. Tasmania.

• **HABITAT** Rocky slopes in the mountains.

• **REMARK** Juvenile leaves are opposite, adult leaves alternate: plants bear both stages together. Similar to cider gum *(Eucalyptus gunnii*, see p.223), this species is distinguished by its fruits.



Height 40 ft (12 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

Family MYRTACEAE	Species *Myrtus luma*	Author Molina

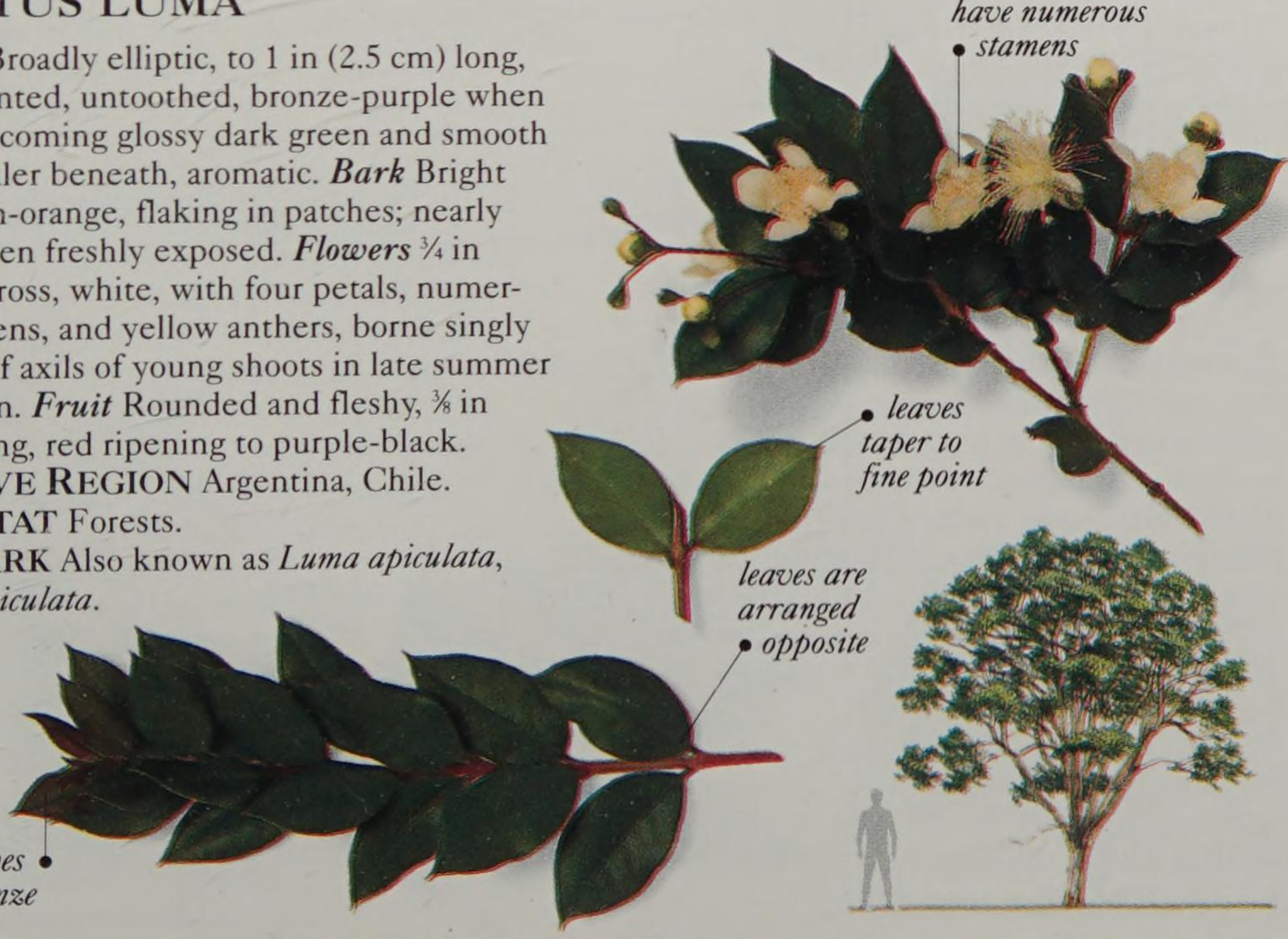
MYRTUS LUMA

Leaves Broadly elliptic, to 1 in (2.5 cm) long, short-pointed, untoothed, bronze-purple when young becoming glossy dark green and smooth above, paler beneath, aromatic. ***Bark*** Bright cinnamon-orange, flaking in patches; nearly white when freshly exposed. ***Flowers*** ¾ in (2 cm) across, white, with four petals, numerous stamens, and yellow anthers, borne singly in the leaf axils of young shoots in late summer to autumn. ***Fruit*** Rounded and fleshy, ⅜ in (1 cm) long, red ripening to purple-black.

• **NATIVE REGION** Argentina, Chile.

• **HABITAT** Forests.

• **REMARK** Also known as *Luma apiculata*, *Myrtus apiculata*.



Height 40 ft (12 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

NYSSACEAE

THE THREE GENERA and seven species of the tupelo family are native to North America and East Asia. The best-known genus is *Nyssa*, whose species display brilliant autumn color. The leaves are alternate, and the small flowers petalless, but those of *Davidia involucrata* have conspicuous bracts.

Family NYSSACEAE	Species *Davidia involucrata*	Author Baillon

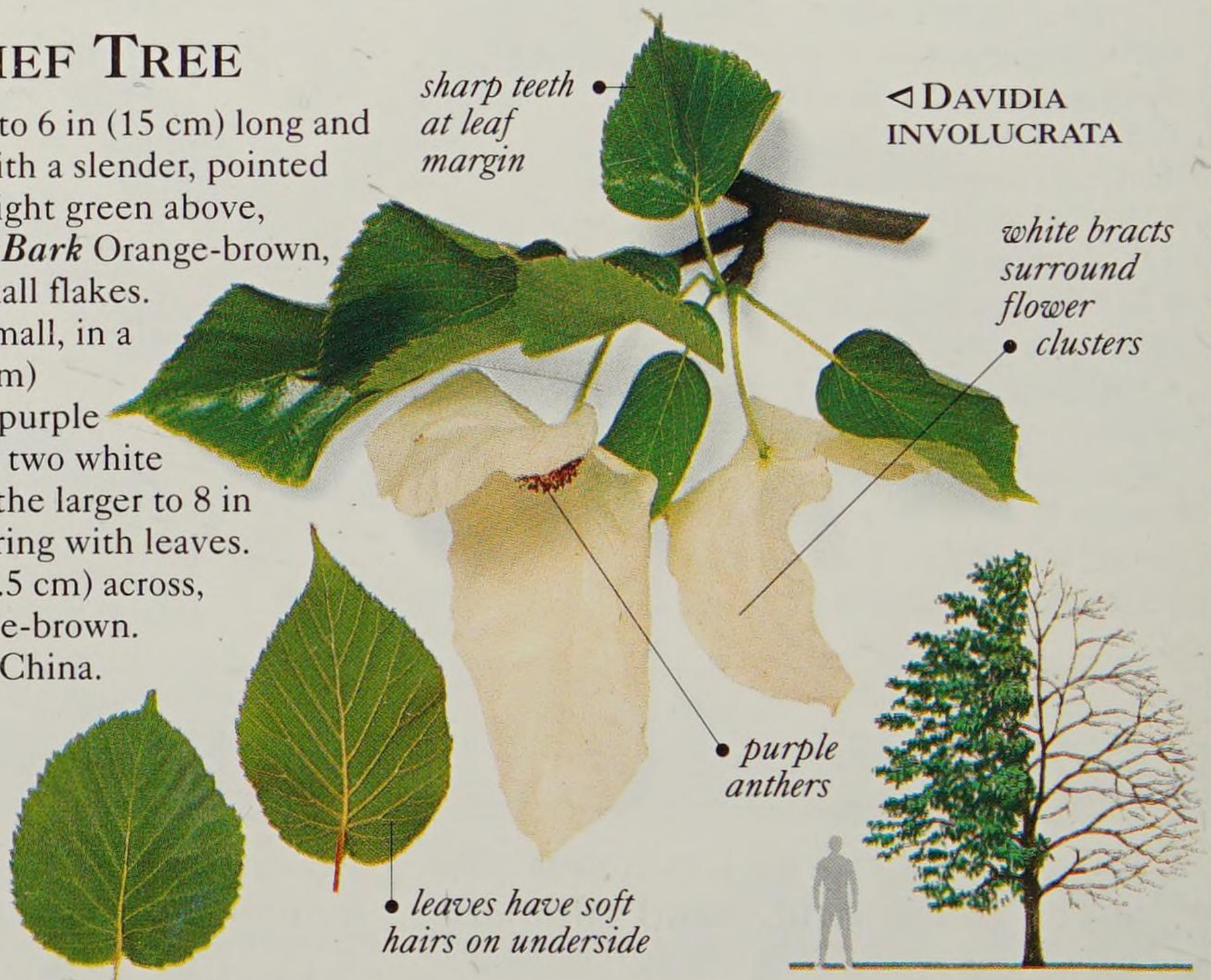
HANDKERCHIEF TREE

Leaves Heart-shaped, to 6 in (15 cm) long and 4¾ in (12 cm) across, with a slender, pointed tip, sharply toothed, bright green above, densely hairy beneath. ***Bark*** Orange-brown, peeling vertically in small flakes. ***Flowers*** Individually small, in a rounded head ¾ in (2 cm) across, conspicuous by purple anthers, surrounded by two white bracts of unequal size, the larger to 8 in (20 cm) long, in late spring with leaves. ***Fruit*** Rounded, 1 in (2.5 cm) across, green ripening to purple-brown.

• **NATIVE REGION** China.

• **HABITAT** Moist mountain woods.

VAR. VILMORINIANA ▷ The leaves of this variety have smooth undersides.



Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family NYSSACEAE	Species *Nyssa sinensis*	Author Oliver

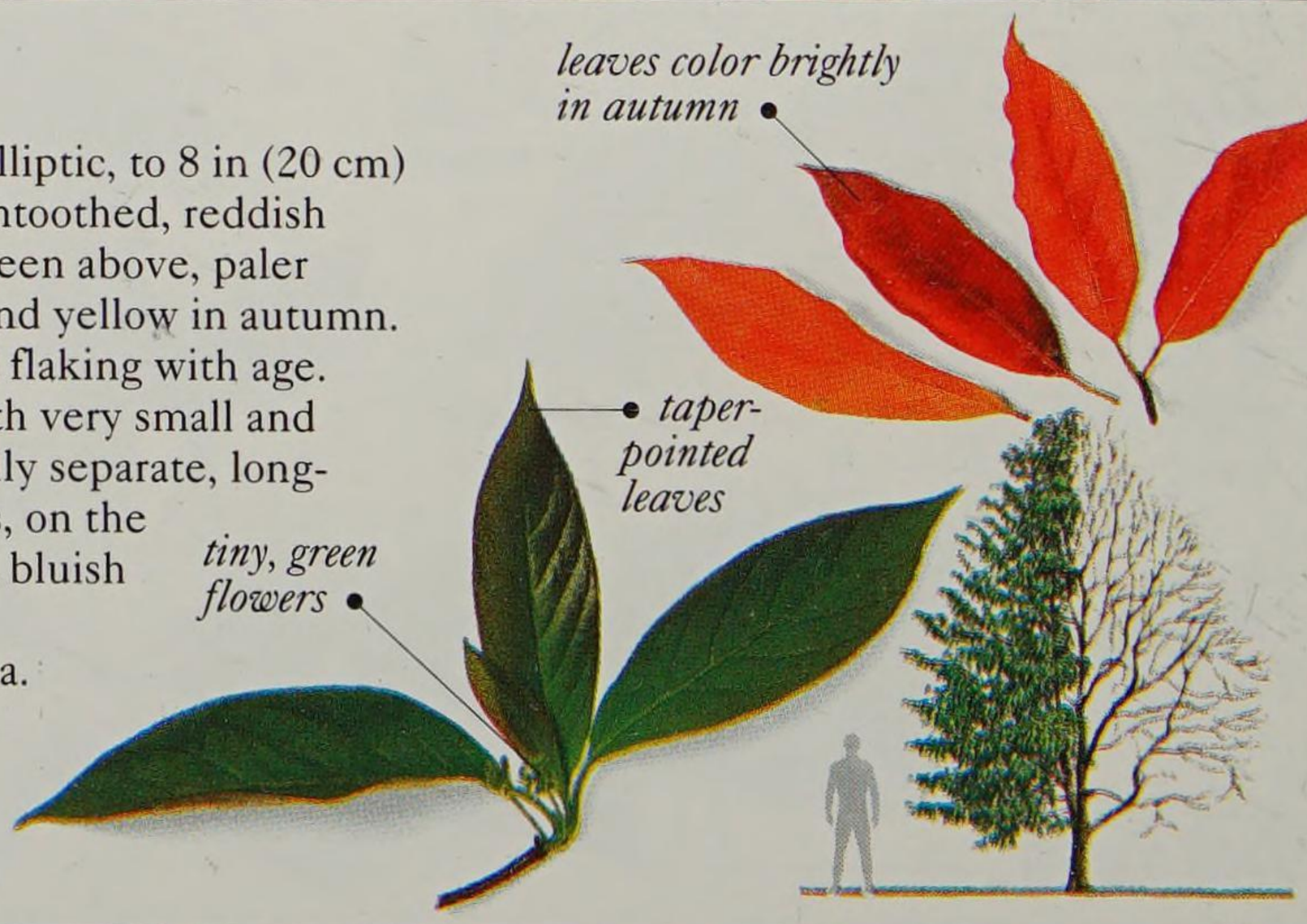
NYSSA SINENSIS

Leaves Oblong-lanceolate to elliptic, to 8 in (20 cm) long and 2½ in (6 cm) across, untoothed, reddish when young becoming deep green above, paler beneath, turning red, orange, and yellow in autumn. ***Bark*** Gray-brown, cracked and flaking with age. ***Flowers*** Males and females both very small and green, with five petals, in usually separate, long-stalked clusters in the leaf axils, on the same plant in summer. ***Fruit*** A bluish berry, about ⅜ in (1 cm) long.

• **NATIVE REGION** C. China.

• **HABITAT** Mountain woods and streambanks.

• **REMARK** A relative of the tupelo *(N. sylvatica*, see p.227).



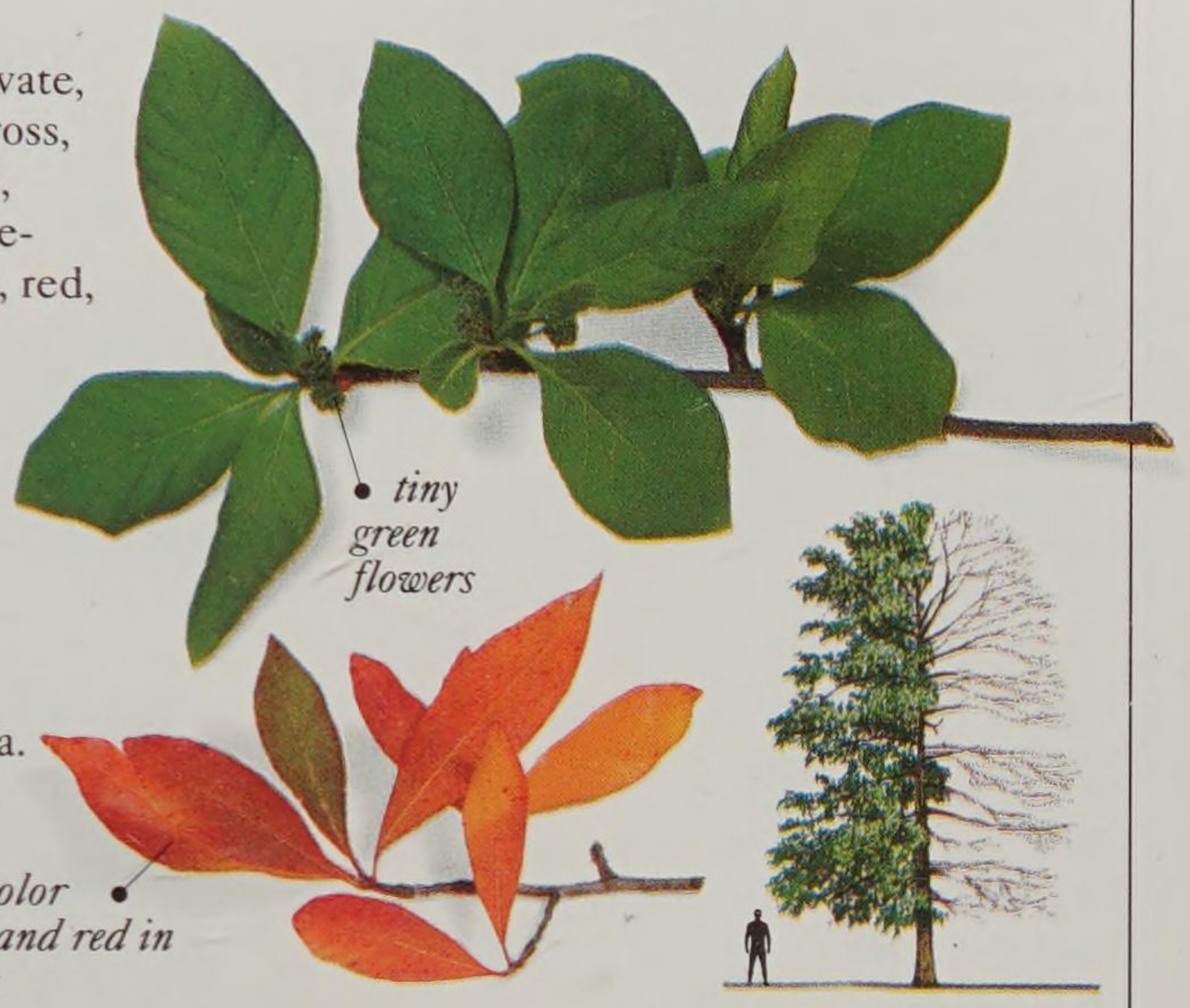
Height 50 ft (15 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family NYSSACEAE	Species *Nyssa sylvatica*	Author Marshall

TUPELO

Leaves Variable, ovate to elliptic or obovate, to 6 in (15 cm) long and 3 in (7.5 cm) across, tapering to a short, blunt point at the tip, untoothed, glossy dark green above, blue-green beneath, turning yellow to orange, red, or purple in autumn. ***Bark*** Dark gray, vertically ridged and breaking into square plates. ***Flowers*** Males and females both very small and green, with five petals, in usually separate, long-stalked clusters in the leaf axils, on the same plant in summer. ***Fruit*** A bluish berry, about ⅜ in (1 cm) long.

- **NATIVE REGION** E. North America.
- **HABITAT** Moist woods and swamps.
- **REMARK** Also known as black gum, pepperidge, sour gum.



Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

OLEACEAE

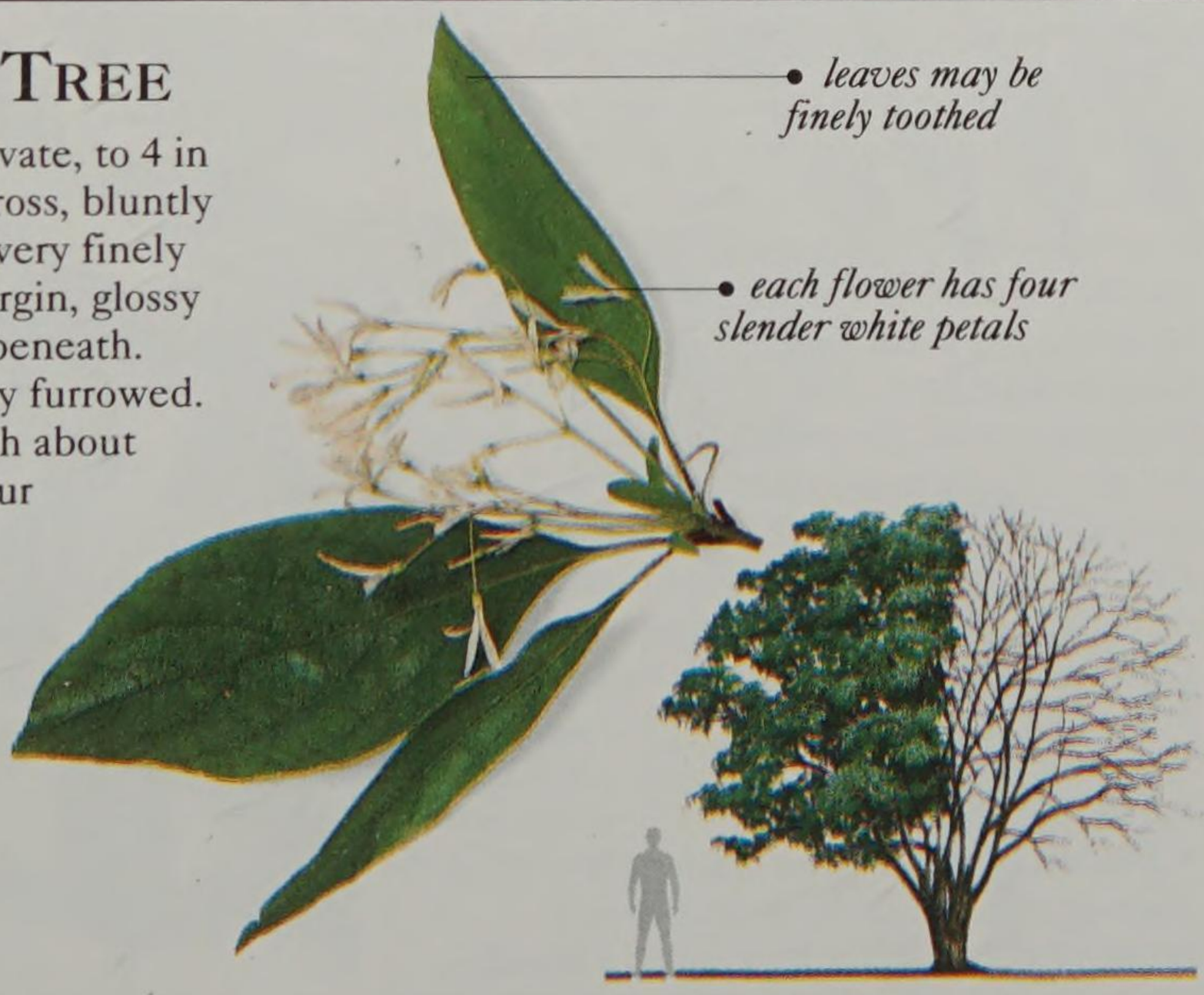
A WIDELY DISTRIBUTED family of about 25 genera that contain nearly 1,000 species of deciduous and evergreen trees, shrubs, and climbers. The plants have opposite, sometimes compound, leaves. The small flowers are either with four petals, which are frequently joined, or without petals.

Family OLEACEAE	Species *Chionanthus retusus*	Author Lindley

CHINESE FRINGE TREE

Leaves Elliptic to ovate or obovate, to 4 in (10 cm) long and 2 in (5 cm) across, bluntly pointed or indented at the tip, very finely toothed or untoothed at the margin, glossy green above, paler and downy beneath. ***Bark*** Gray-brown, corky, deeply furrowed. ***Flowers*** Males and females both about ¾ in (2 cm) long, white, with four strap-shaped petals, borne in upright panicles at the ends of the young shoots, on separate plants in summer. ***Fruit*** An egg-shaped, deep blue berry, ⅝ in (1.5 cm) long.

- **NATIVE REGION** China, Japan.
- **HABITAT** Woods and on cliffs in sunny, moist places.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family OLEACEAE	Species *Chionanthus virginicus*	Author Linnaeus

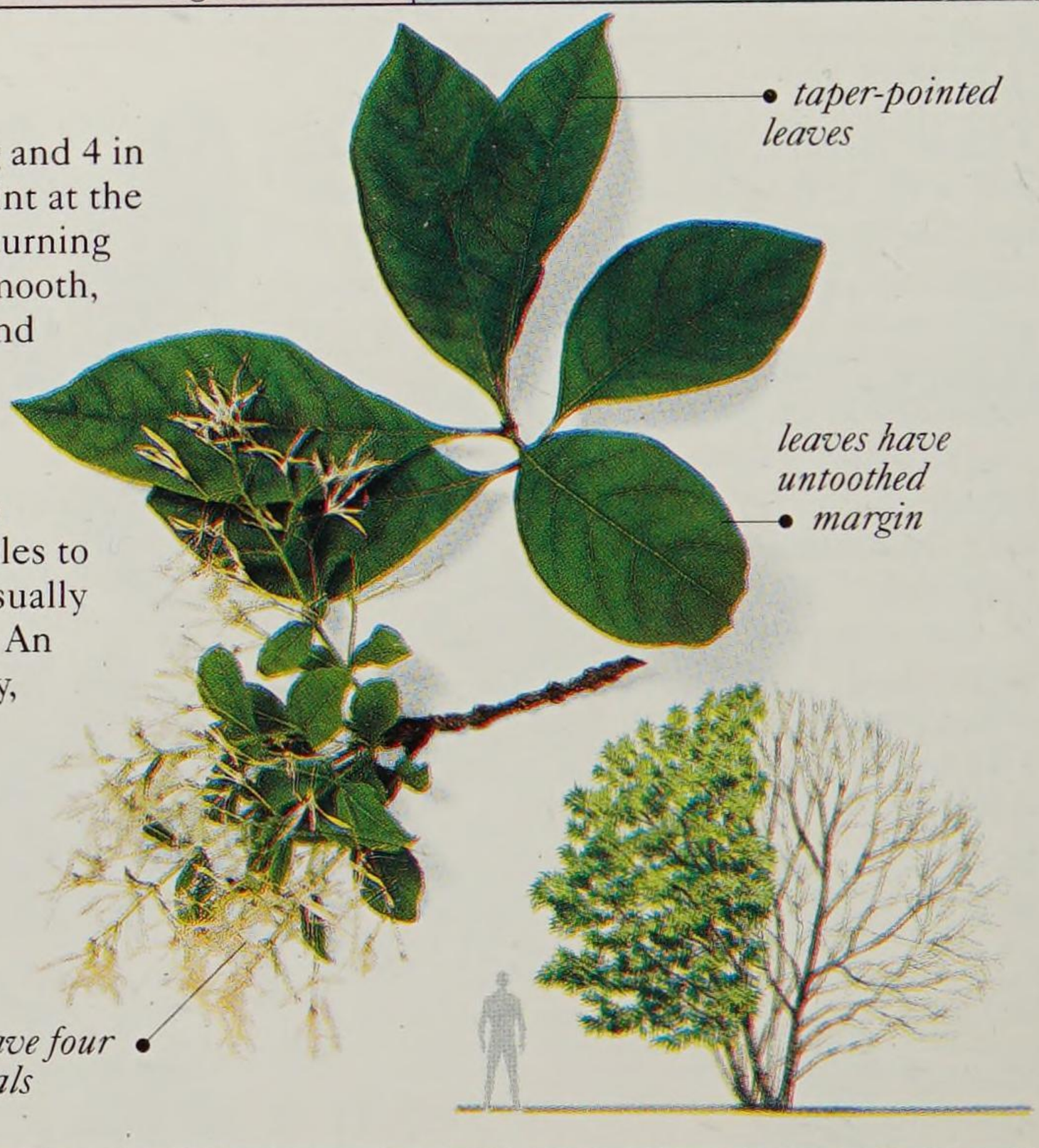
FRINGE TREE

Leaves Elliptic, to 8 in (20 cm) long and 4 in (10 cm) across, tapered to a short point at the tip, untoothed, glossy green above, turning yellow in autumn. ***Bark*** Gray and smooth, furrowed with age. ***Flowers*** Males and females both to 1¼ in (3 cm) long, white, slightly fragrant, with four to six slender, strap-shaped petals, on slender, drooping stalks, borne in conical, upright panicles, male panicles to 8 in (20 cm) long, females shorter, usually on separate plants in summer. ***Fruit*** An egg-shaped, bloomy, deep blue berry, ¾ in (2 cm) long.

• **NATIVE REGION**
E. United States.

• **HABITAT** Moist woods and riverbanks.

• **REMARK** Also known as old man's beard. This species can be either a shrub or a small tree.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family OLEACEAE	Species *Fraxinus americana*	Author Linnaeus

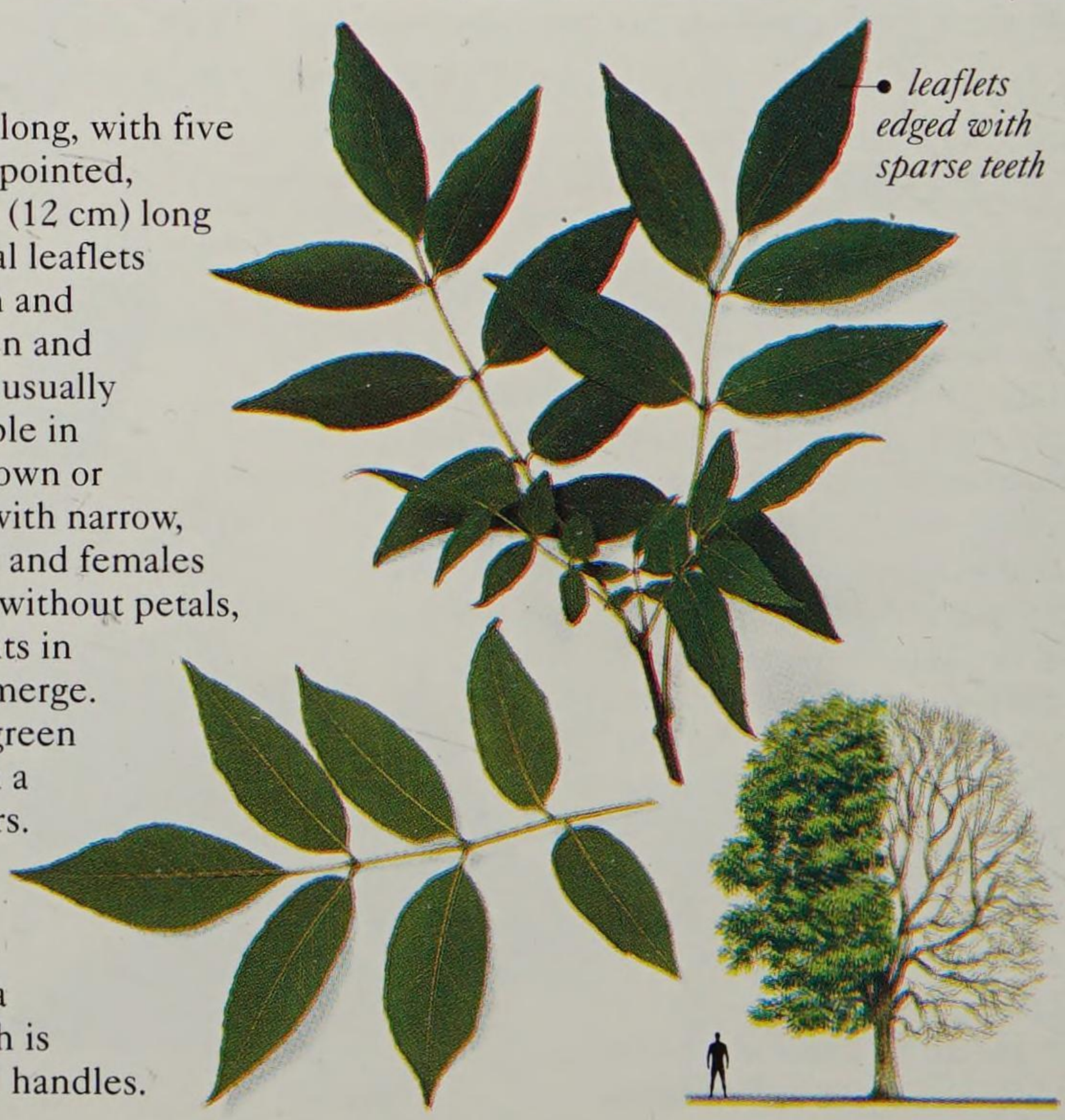
WHITE ASH

Leaves Pinnate, to 14 in (35 cm) long, with five to nine ovate to lanceolate, taper-pointed, sparsely toothed leaflets, to 4¾ in (12 cm) long and 3 in (7.5 cm) across, the lateral leaflets carried on short stalks, dark green and smooth above, blue-green to green and smooth or slightly hairy beneath, usually turning yellow or sometimes purple in autumn; winter leaf buds dark brown or nearly black. ***Bark*** Gray-brown, with narrow, interlacing ridges. ***Flowers*** Males and females both very small, green or purple, without petals, borne in clusters on separate plants in spring before the young leaves emerge. ***Fruit*** A key, to 2 in (5 cm) long, green ripening to pale brown, ending in a flattened wing, hanging in clusters.

• **NATIVE REGION**
E. North America.

• **HABITAT** Rich woods.

• **REMARK** The trees produce a close-grained durable wood which is traditionally used for making tool handles.



Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

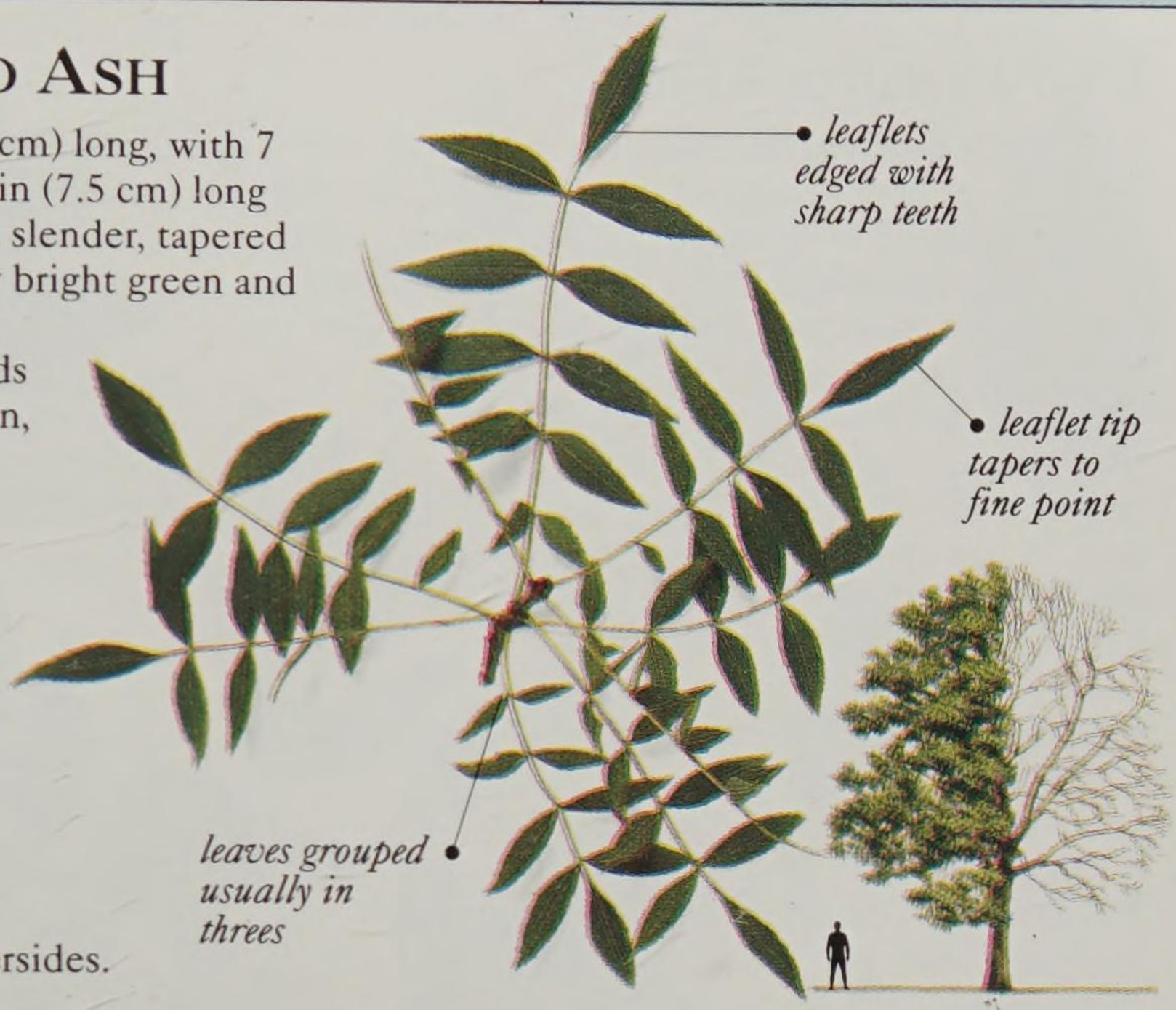
Family OLEACEAE	Species *Fraxinus angustifolia*	Author Vahl

NARROW-LEAVED ASH

Leaves Pinnate, to 10 in (25 cm) long, with 7 to 13 lanceolate leaflets, to 3 in (7.5 cm) long and ¾ in (2 cm) across, with a slender, tapered point, sharply toothed, glossy bright green and smooth above, the lateral leaflets unstalked; winter buds dark brown. ***Bark*** Gray-brown, ridged. ***Flowers*** Very small, green or purple, without petals, borne in clusters in spring before the leaves. ***Fruit*** With a flattened wing at the end, to 1½ in (4 cm) long, green at first ripening to pale brown, in hanging clusters.

• NATIVE REGION N. Africa, S.W. Europe.

• HABITAT Woods and riversides.



Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

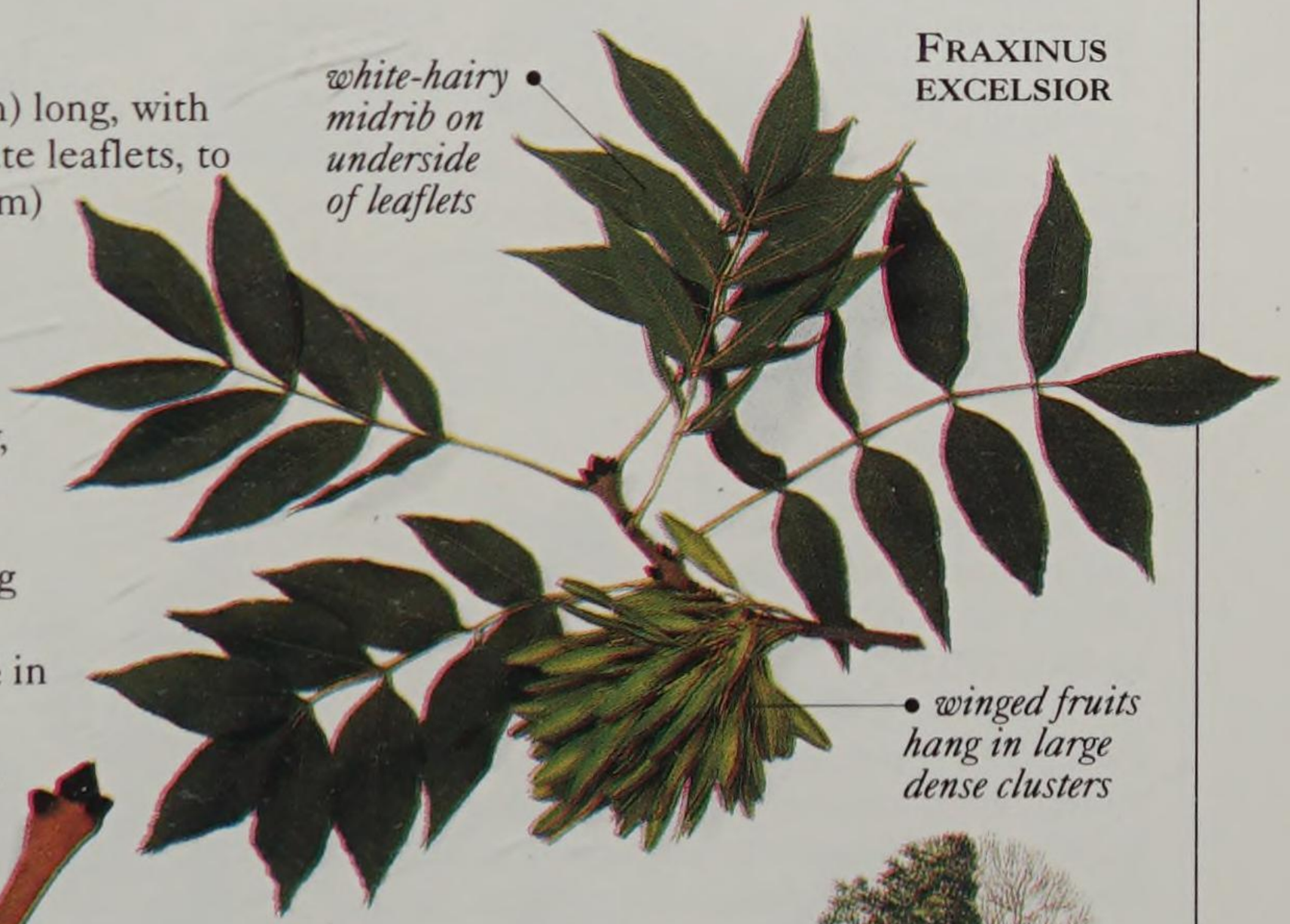
Family OLEACEAE	Species *Fraxinus excelsior*	Author Linnaeus

EUROPEAN ASH

Leaves Pinnate, to 12 in (30 cm) long, with 9 to 13 oblong-ovate to lanceolate leaflets, to 4 in (10 cm) long and 1¼ in (3 cm) across, taper-pointed, sharply toothed, dark green above, the lateral leaflets short-stalked. ***Bark*** Pale gray and smooth, fissured with age. ***Flowers*** Tiny, purple, without petals, opening from nearly black buds, on the same or separate plants in spring before the leaves. ***Fruit*** With a flattened wing at the end, to 1½ in (4 cm) long, green ripening to pale brown, in hanging clusters.

• NATIVE REGION Europe.

• HABITAT Moist woods and riverbanks.



FRAXINUS EXCELSIOR

◁ 'JASPIDEA'
In winter, this form is easily distinguished by its stout yellow shoots, which make a striking contrast to the black leaf buds.

Height 130 ft (40 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family OLEACEAE	Species *Fraxinus ornus*	Author Linnaeus

FLOWERING ASH

Leaves Pinnate, to 8 in (20 cm) or more long, with five to nine oblong to ovate, taper-pointed, sharply toothed leaflets, to 4¾ in (12 cm) long and 2 in (5 cm) across, the lateral leaflets distinctly stalked, matte green above, paler beneath; winter leaf buds dark gray. ***Bark*** Gray and smooth. ***Flowers*** Small and white, with four slender petals ¼ in (6 mm) long, fragrant, borne in large, conical, fluffy clusters to 8 in (20 cm) long, in late spring to early summer. ***Fruit*** A winged key, to 1½ in (4 cm) long, green ripening to pale brown, ending in a flattened wing, in clusters.

• **NATIVE REGION** S.W. Asia, S. Europe.

• **HABITAT** Woods on dry, sunny slopes.

• **REMARK** The flowers of most ash *(Fraxinus)* species are inconspicuous. The flower clusters of this species are very showy and give the tree its common name. Also known as manna ash.

Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

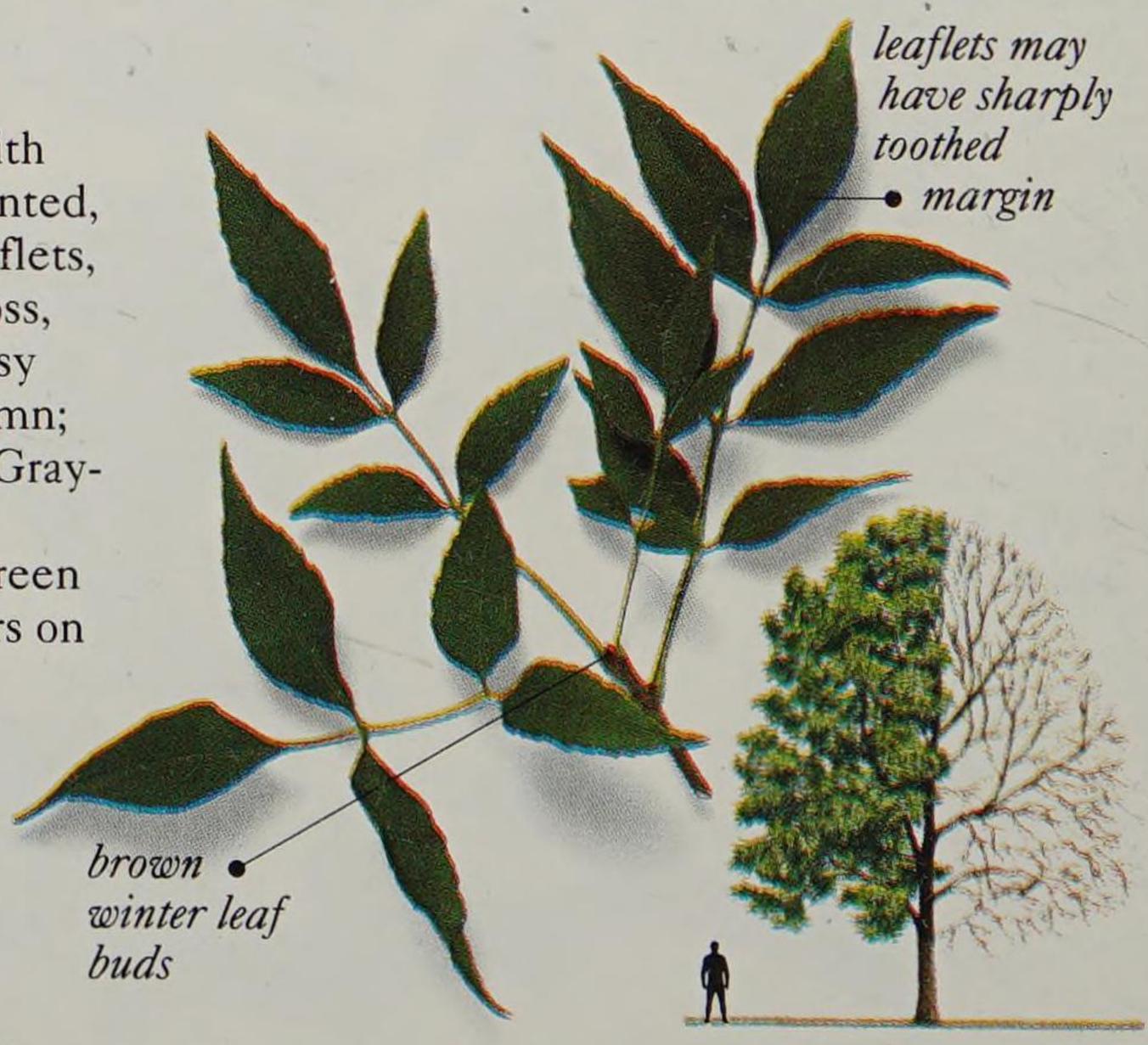
Family OLEACEAE	Species *Fraxinus pennsylvanica*	Author Marshall

GREEN ASH

Leaves Pinnate, to 12 in (30 cm) long, with five to nine ovate to lanceolate, taper-pointed, sharply toothed or sometimes smooth leaflets, to 4¾ in (12 cm) long and 2 in (5 cm) across, the lateral leaflets distinctly stalked, glossy dark green above, turning yellow in autumn; winter leaf buds with brown hairs. ***Bark*** Gray-brown, with narrow, interlacing ridges. ***Flowers*** Males and females very small, green or purple, with no petals, borne in clusters on separate plants in spring before the young leaves. ***Fruit*** A key, to 2 in (5 cm) long, green at first ripening to pale brown, ending in a flattened wing, hanging in clusters.

• **NATIVE REGION** North America.

• **HABITAT** Moist woods.



Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family OLEACEAE	Species *Ligustrum lucidum*	Author Aiton f.

CHINESE PRIVET

Leaves Ovate, to 4 in (10 cm) long and 2 in (5 cm) across, tapering to a fine point at the tip, untoothed, bronze when young becoming glossy dark green above, paler and dull beneath, smooth on both sides. ***Bark*** Gray and smooth. ***Flowers*** Small and white, odd fragrance, with four joined petals, profusely borne in large, conical, upright panicles to 8 in (20 cm) long, over a long period in late summer and autumn. ***Fruit*** A blue-black berry, ⅜ in (1 cm) long.

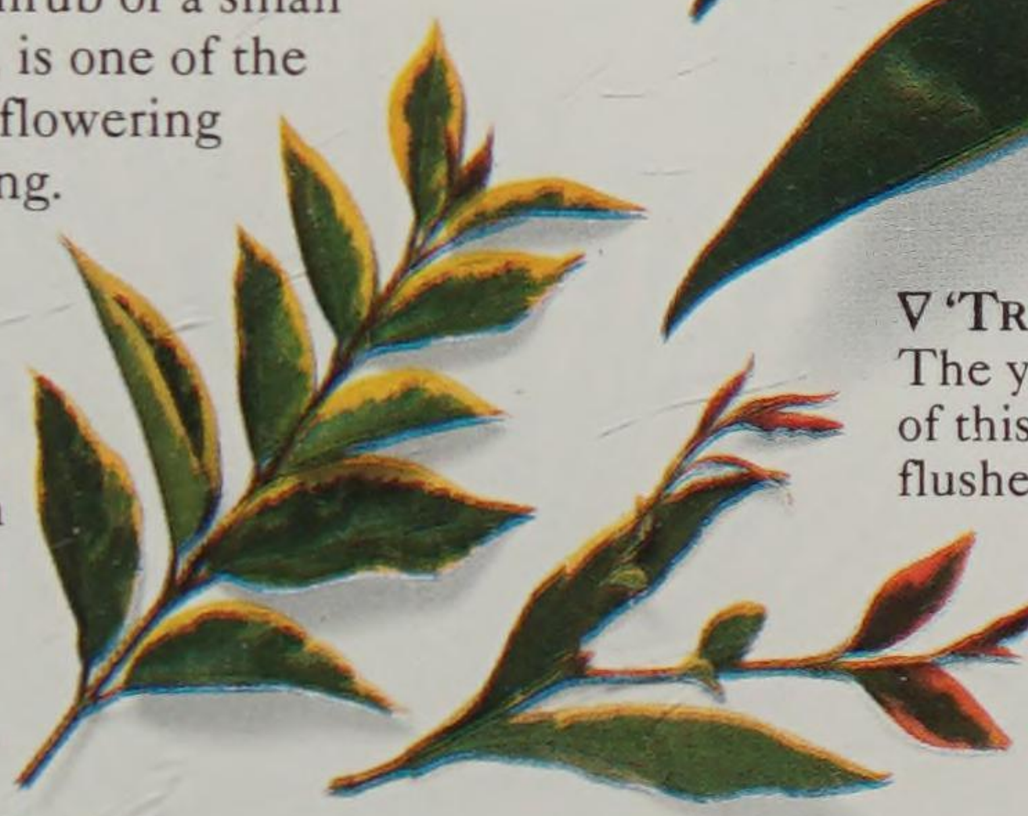
• **NATIVE REGION** China.

• **HABITAT** Hillside woods and river valleys in mountains.

• **REMARK** This species, which can be either a large shrub or a small to medium-sized tree, is one of the evergreen privets. Its flowering season is unusually long.

LIGUSTRUM LUCIDUM

'EXCELSUM SUPERBUM' ▷
The leaves of this form are tinged bronze when young. They mature to bright green with a yellow margin, which becomes creamy white.



▽ **'TRICOLOR'**
The young foliage of this form is flushed pink.

Height 40 ft (12 m)	Shape Broadly conical	Leaf persistence Evergreen	Leaf type

Family OLEACEAE	Species *Phillyrea latifolia*	Author Linnaeus

PHILLYREA LATIFOLIA

Leaves Ovate to lanceolate, to 2 in (5 cm) long and 1½ in (4 cm) across, toothed, glossy very dark green above, paler beneath, smooth on both sides; on juvenile plants, variable in shape and size. ***Bark*** Pale gray and smooth, becoming dark gray and cracking into small, square plates with age. ***Flowers*** Very small and greenish white, the exserted stamens with yellow anthers, borne in clusters in the leaf axils in late spring to early summer. ***Fruit*** A small, rounded, blue-black berry, about ⅜ in (1 cm) across.

• **NATIVE REGION** S. Europe.

• **HABITAT** Evergreen woods.

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

PALMAE

THE PALMS FORM A distinct group of more than 200 genera with over 2,500 species of mainly tropical distribution. In North America they are native to the southern States alone; Europe has two native species, in the western Mediterranean and in Crete.

Palms are trees or shrubs, sometimes climbing, that differ from other trees in several ways. With few exceptions, they have a single, unbranched stem which, once formed, does not increase in girth. The often very large leaves are mainly one of two types, either palmately divided, as in the fan palms (eg *Trachycarpus)*, or pinnately divided, as in the feather palms (eg *Phoenix).* The small flowers have three sepals and three petals, and are often carried in very large, heavy clusters, males and females sometimes on separate plants.

Family PALMAE	Species *Trachycarpus fortunei*	Author (W.J. Hooker) Wendland

CHUSAN PALM

Leaves Fan-shaped, to 4 ft (120 cm) across, segmented, dark green above, blue-green beneath. ***Bark*** Densely covered with brown, fibrous remnants of old leaves. ***Flowers*** Very small and yellow, fragrant, in large, drooping panicles on separate plants in early summer. ***Fruit*** A rounded to kidney-shaped, three-lobed, blue-black berry, ½ in (1.2 cm) across.

- **NATIVE REGION** C. and S. China.
- **HABITAT** Mountain slopes.

Height 33 ft (10 m)	Shape Unique	Leaf persistence Evergreen	Leaf type

PITTOSPORACEAE

THE NINE GENERA and more than 200 species in this family of evergreen trees, shrubs, and climbing plants are native to tropical regions, particularly Australasia. The leaves are alternate, most often untoothed. Small, usually tubular, five-lobed flowers develop into a dry or fleshy fruit.

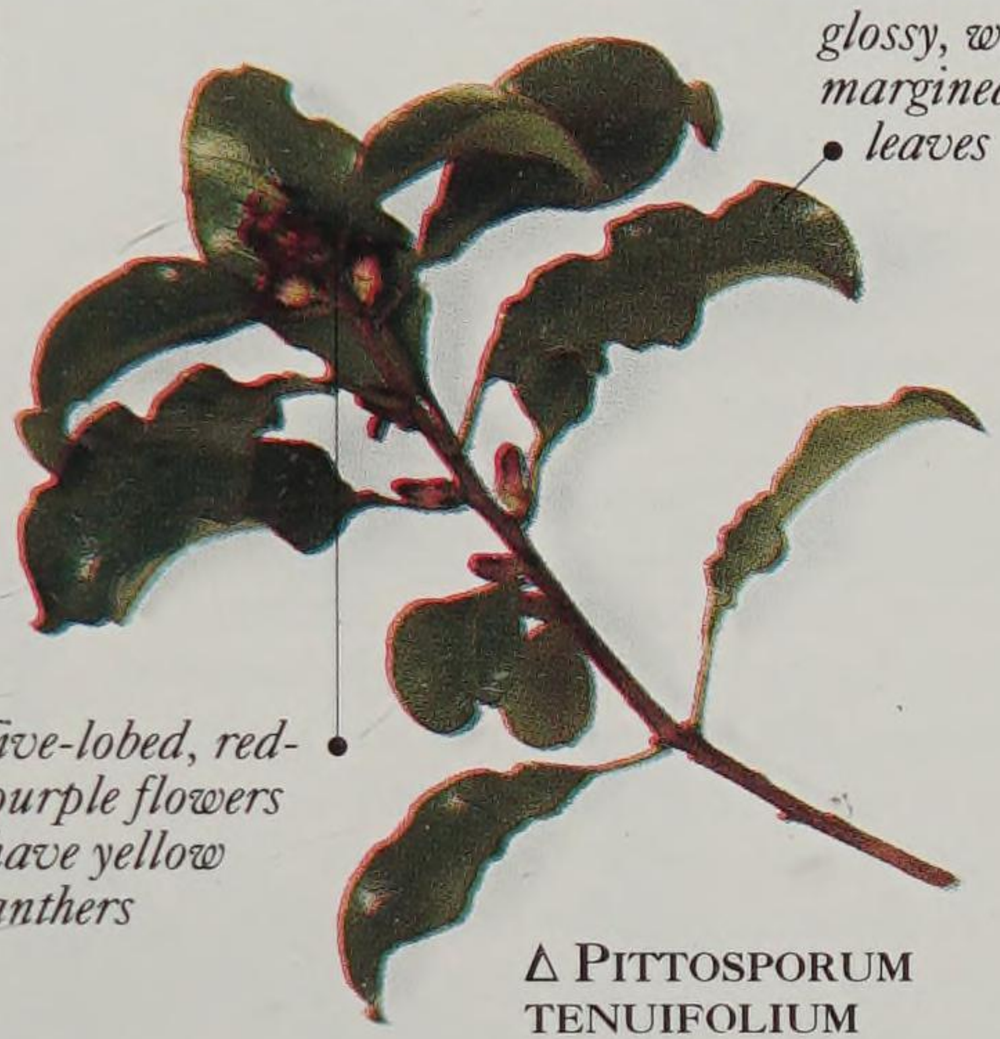
Family PITTOSPORACEAE	Species *Pittosporum tenuifolium*	Author Gaertner

PITTOSPORUM TENUIFOLIUM

Leaves Oblong to elliptic, to 2½ in (6 cm) long and ¾ in (2 cm) across, with a wavy margin, light green, smooth, on deep purple-black shoots. ***Bark*** Dark gray and smooth. ***Flowers*** Small, tubular, about ⅜ in (1 cm) long, whitish, with five reflexed, deep red-purple lobes and yellow anthers, strongly fragrant, borne singly or in clusters in the leaf axils in late spring. ***Fruit*** A rounded capsule, about ½ in (1.2 cm) across, green ripening to nearly black.

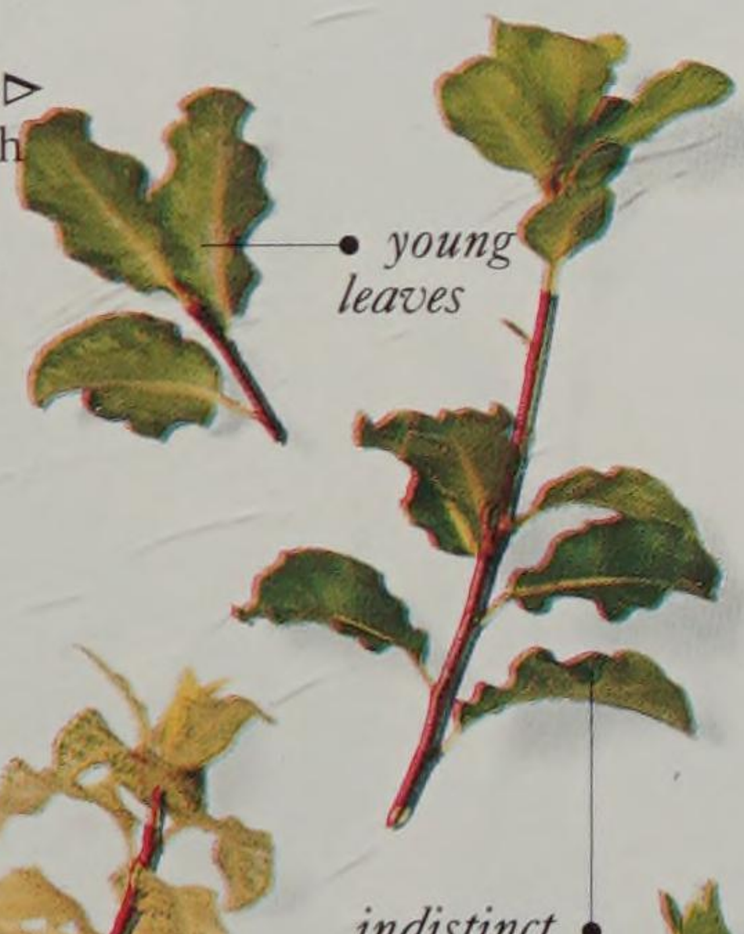
• NATIVE REGION New Zealand.

• HABITAT Forests from coastline to mountain level.



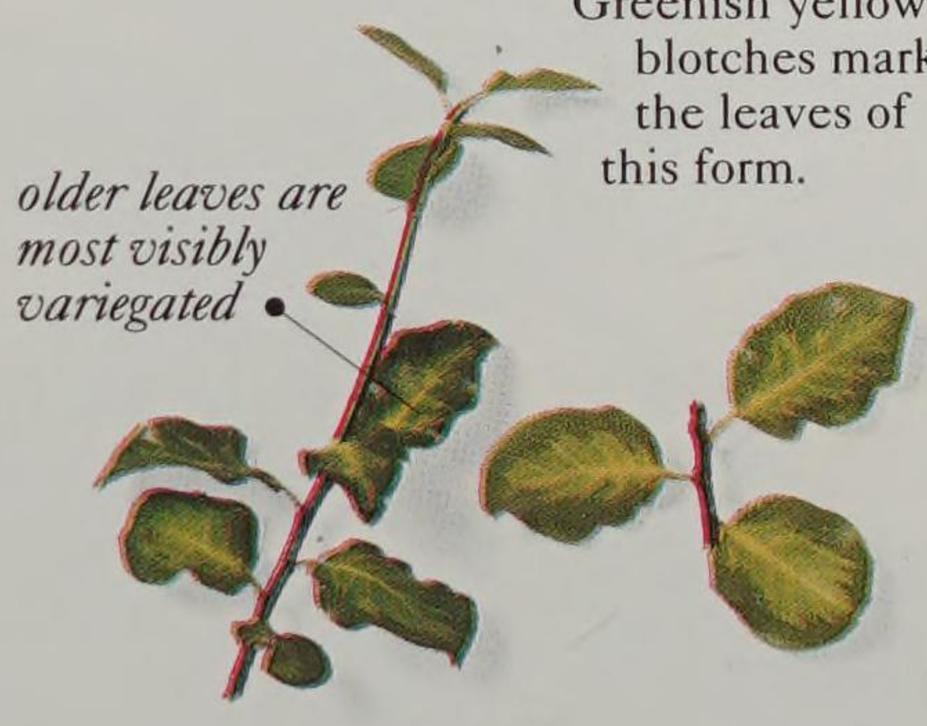
△ PITTOSPORUM TENUIFOLIUM

'ABBOTSBURY GOLD' ▷
The yellow-green blotch on the leaves of this form is most noticeable on the young foliage.

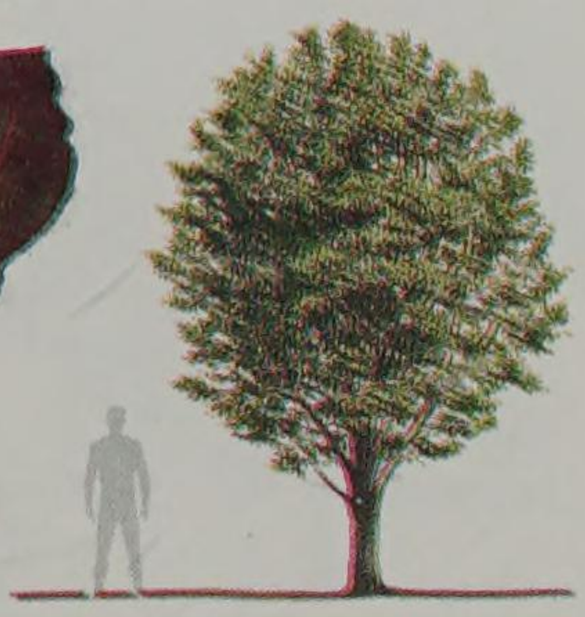


'IRENE PATERSON' ▷
This form has creamy white young leaves, which mature to dark green marked white.

∇ 'EILA KEIGHTLEY'
Greenish yellow blotches mark the leaves of this form.



◁ 'PURPUREUM'
The pale green young leaves of this form mature to deep red-purple.



Height 33 ft (10 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

PLATANACEAE

THE PLANE FAMILY CONSISTS of only one genus, *Platanus*, and seven species. The large, deciduous trees grow wild mainly in the United States and Mexico. The leaves are alternate and palmately lobed, except for those of the Southeast Asian *Platanus kerrii*, which are unlobed. The dense clusters of tiny flowers hang on slender stalks, either singly or in groups.

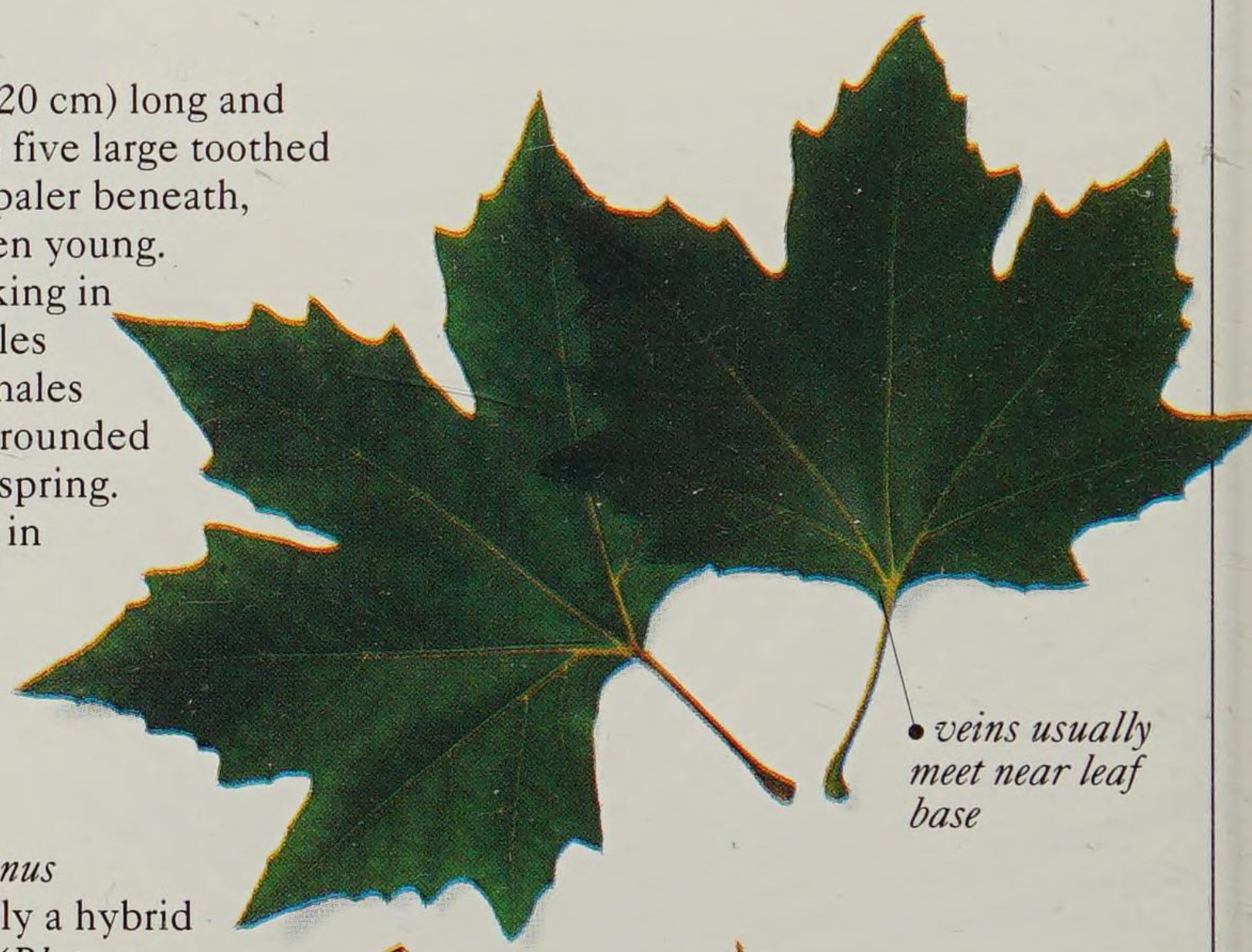
Family PLATANACEAE	Species *Platanus* x *acerifolia*	Author Willdenow

LONDON PLANE

Leaves Palmately lobed, to 8 in (20 cm) long and 10 in (25 cm) across, with three to five large toothed lobes, glossy bright green above, paler beneath, covered in scurfy brown hairs when young. ***Bark*** Brown, gray, and cream, flaking in patches. ***Flowers*** Males and females both very small, males yellow, females reddish, borne in separate, small, rounded clusters on the same plant in late spring. ***Fruit*** A rounded, dense cluster, 1 in (2.5 cm) across, green ripening to brown, covered in spiky brown bristles, hanging two to four together, persisting over winter.

• **NATIVE REGION**
Of garden origin.

• **REMARK** Also known as *Platanus* x *hispanica*. This species is probably a hybrid between the American sycamore *(Platanus occidentalis*, see p.235) and the oriental plane *(Platanus orientalis*, see p.235).



Height 115 ft (35 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

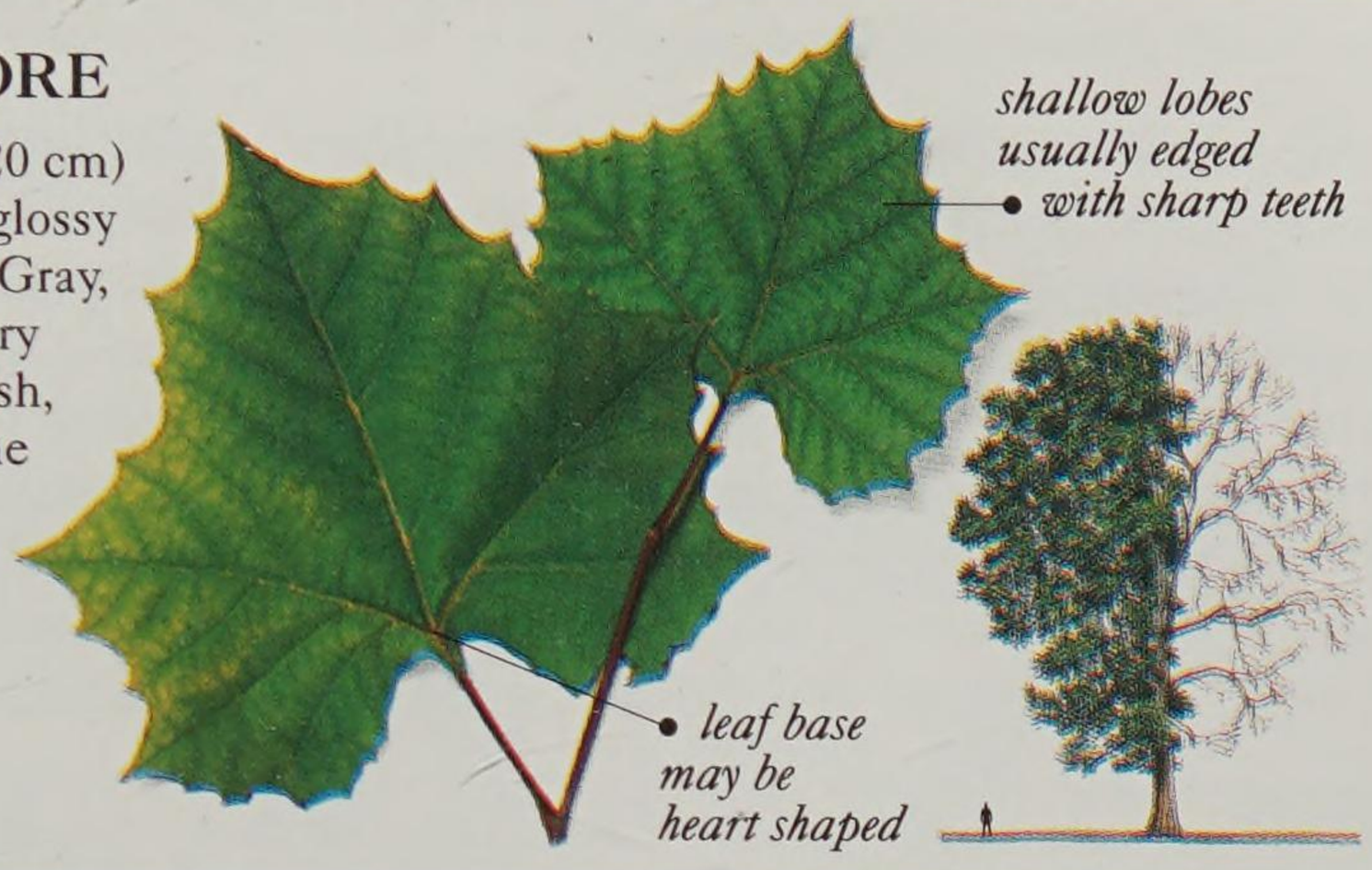
Family PLATANACEAE	Species *Platanus occidentalis*	Author Linnaeus

AMERICAN SYCAMORE

Leaves Palmately lobed, to 8 in (20 cm) long and across, with three lobes, glossy green above, paler beneath. ***Bark*** Gray, brown, cream, flaking. ***Flowers*** Very small, males yellow, females reddish, in separate, rounded clusters on the same plant in late spring. ***Fruit*** A rounded, dense, brown cluster, 1 in (2.5 cm) across.

• **NATIVE REGION**
E. North America.

• **HABITAT** Rich, moist soil.



Height 115 ft (35 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family PLATANACEAE	Species *Platanus orientalis*	Author Linnaeus

ORIENTAL PLANE

Leaves Palmately lobed, to 8 in (20 cm) long and 10 in (25 cm) across, cut to below the middle into usually five toothed lobes, glossy green above, paler beneath, with scurfy brown hairs when young. ***Bark*** Gray, pinkish brown, and cream, flaking in patches. ***Flowers*** Males and females both very small, males yellow, females reddish, borne in separate, small, rounded clusters on the same plant in late spring. ***Fruit*** A rounded, dense, brown cluster, 1 in (2.5 cm) across, hanging up to six on each stalk, persisting on the plant over winter.

• **NATIVE REGION** S.E. Europe.

• **HABITAT** Mountain woods, riversides, and moist places.

Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

PROTEACEAE

SOME 75 GENERA and over 1,000 species of evergreen trees and shrubs are included in this family. Native to the southern hemisphere, they grow wild throughout this part of the world. Some species extend also to warm regions of the northern hemisphere. The leaves are alternate, simple to pinnate; the flowers have a petal-like calyx divided into four lobes, although the petals themselves are very small and inconspicuous.

Proteaceae is best known for its ornamental plants (eg species of *Grevillea*, *Banksia*, *Protea*, and *Telopea)*, and for *Macadamia* species, cultivated in Australia and Hawaii for their edible nuts.

Family PROTEACEAE	Species *Embothrium coccineum*	Author J.R. & J.G. Forster

CHILEAN FIRE BUSH

Leaves Elliptic to oblong, variable, to 6 in (15 cm) long and 1¼ in (3 cm) across, untoothed, dark green to blue-green above, paler beneath, leathery, smooth on both sides. ***Bark*** Purple-brown, smooth, flaking with age. ***Flowers*** Tubular at first, to 2 in (5 cm) long, splitting into four lobes, the lobes curling backward leaving the style protruding, bright orange-red, borne in clusters in late spring to early summer. ***Fruit*** A woody capsule, to 1¼ in (3 cm) long, with a long beak.

• **NATIVE REGION** Argentina, Chile.

• **HABITAT** Open places, at all altitudes from the coast to the mountains.

• **REMARK** This species is one of the most striking representatives of its family.

Height 30 ft (9 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

RHAMNACEAE

THE 60 GENERA AND around 900 species of deciduous and evergreen trees, shrubs, and climbing plants belonging to this family grow wild in all parts of the world. They are sometimes spiny, bearing alternate or opposite leaves, and small male and female flowers, found sometimes on separate plants. Several species of buckthorn *(Rhamnus)* yield dyes.

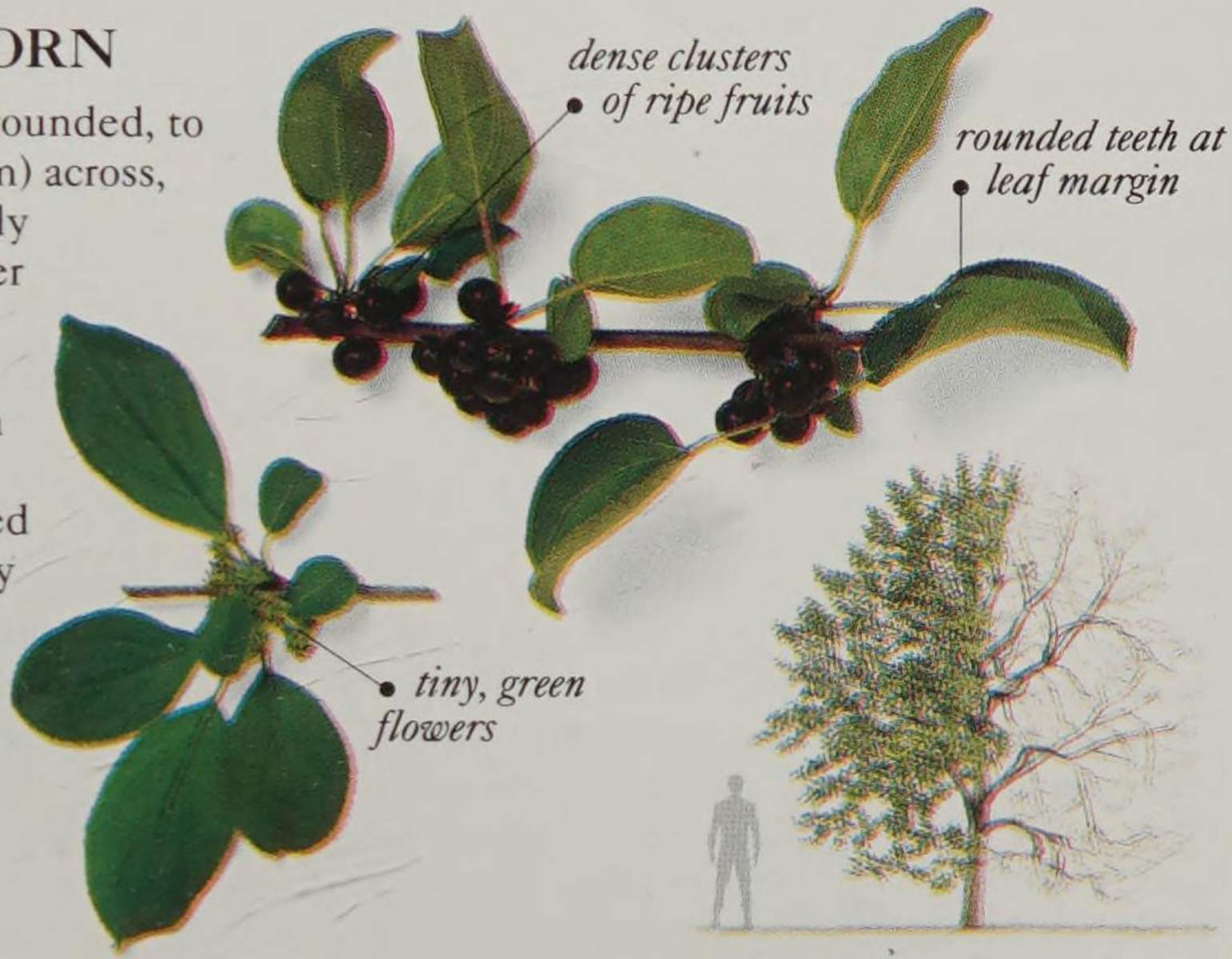
Family RHAMNACEAE	Species *Rhamnus cathartica*	Author Linnaeus

COMMON BUCKTHORN

Leaves Broadly ovate to nearly rounded, to 2½ in (6 cm) long and 1½ in (4 cm) across, with a short point at the tip, finely toothed, glossy green above, paler beneath, turning yellow in autumn, borne on sparsely spiny shoots. ***Bark*** Dark orange-brown and scaly. ***Flowers*** Small, with tiny petals and a green, four-lobed calyx, fragrant, in clusters in early to midsummer. ***Fruit*** Rounded, fleshy, berrylike, to ⅜ in (1 cm) across, green ripening to black.

• **NATIVE REGION**
Asia, Europe.

• **HABITAT** Woods, thickets, and hedgerows, on chalky soil.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family RHAMNACEAE	Species *Rhamnus frangula*	Author Linnaeus

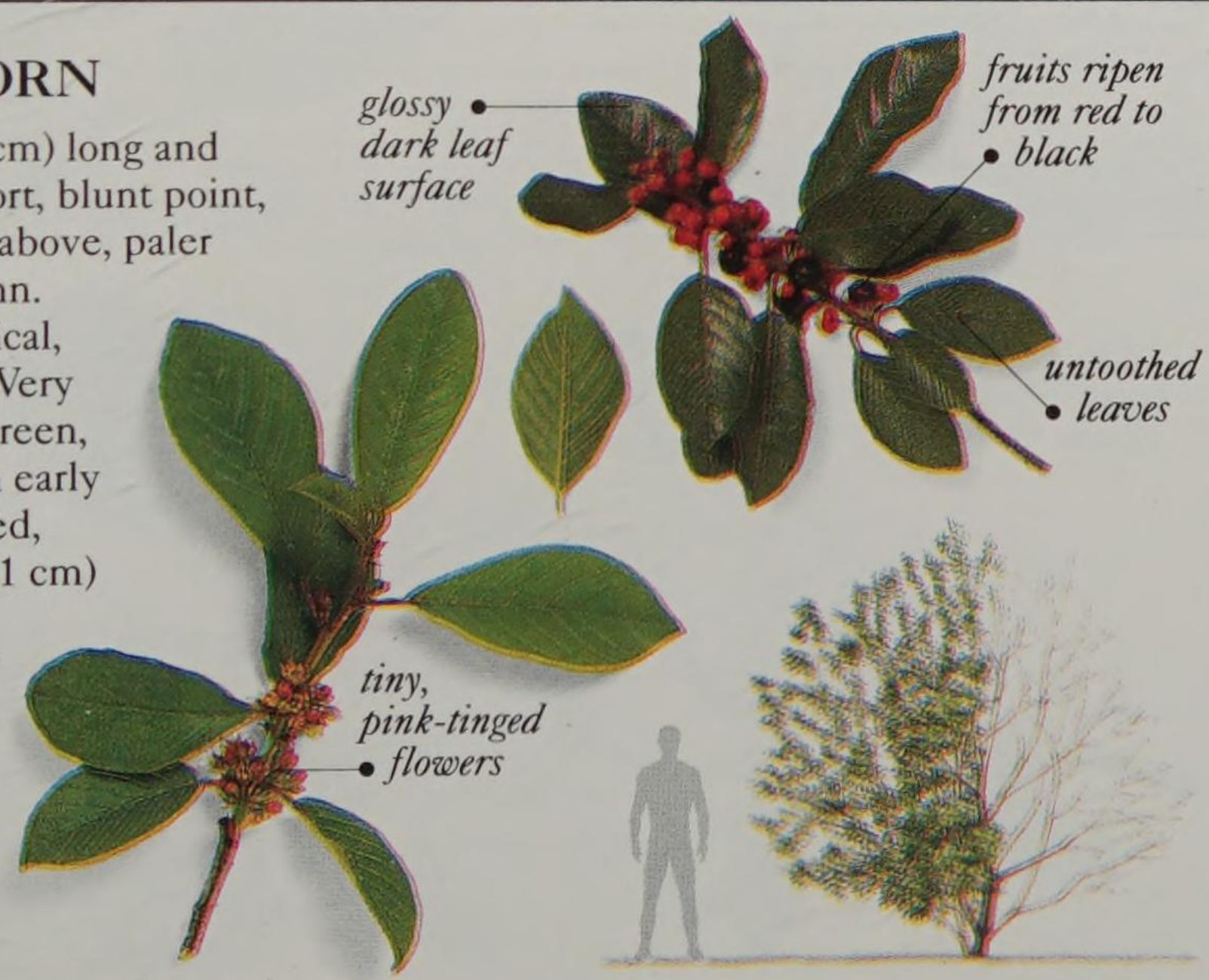
ALDER BUCKTHORN

Leaves Obovate, to 2¾ in (7 cm) long and 1½ in (4 cm) across, with a short, blunt point, untoothed, glossy dark green above, paler beneath, turning red in autumn. ***Bark*** Gray, smooth, with vertical, shallow, pale cracks. ***Flowers*** Very small, with tiny petals and a green, five-lobed calyx, in clusters in early to late summer. ***Fruit*** Rounded, fleshy, and berrylike, to ⅜ in (1 cm) across, green becoming red ripening to black.

• **NATIVE REGION**
N. Africa, W. Asia, Europe.

• **HABITAT** Woods and scrub, usually on wet soil.

• **REMARK** Also known as *Frangula alnus*.



Height 17 ft (5 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

ROSACEAE

THIS FAMILY is a widely distributed and very important collection of deciduous and evergreen trees, shrubs, and herbaceous plants, containing over 100 genera and 3,000 species.

The leaves are usually alternate, and vary from simple and untoothed to pinnate. The flowers are usually five-petaled. Several different types of fruit are produced, and the family is divided into groups on the basis of their structure. The trees in this book fall into two of these groups. Both have fleshy, often edible, fruits, but whereas those of *Prunus* species contain only a single seed, those of *Amelanchier*, *Cotoneaster*, *Crataegus*, *Malus*, *Mespilus*, *Photinia*, *Pyrus*, and *Sorbus* contain two or more seeds.

Family ROSACEAE	Species *Amelanchier arborea*	Author (A. Michaux) Fernald

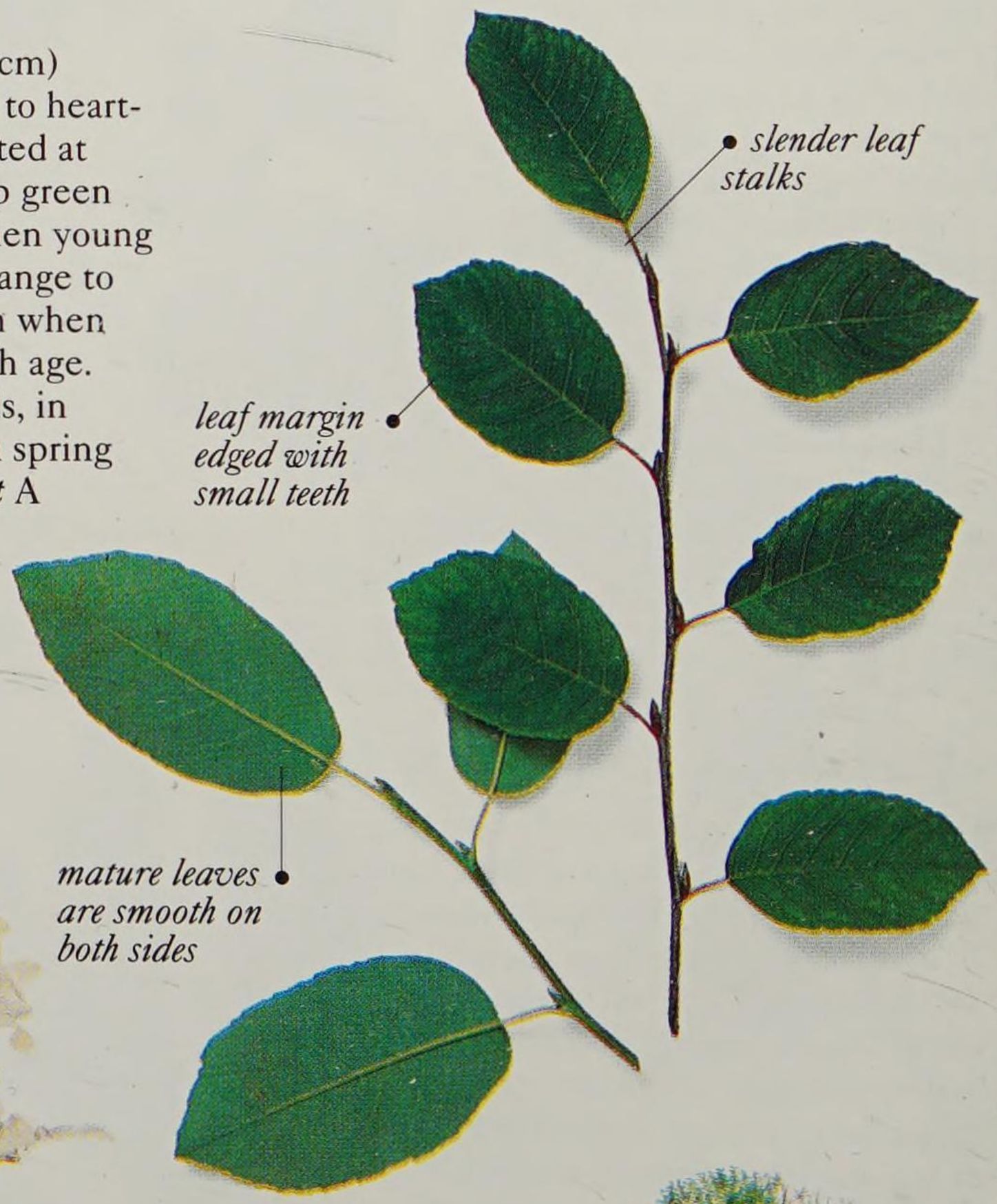
SERVICEBERRY

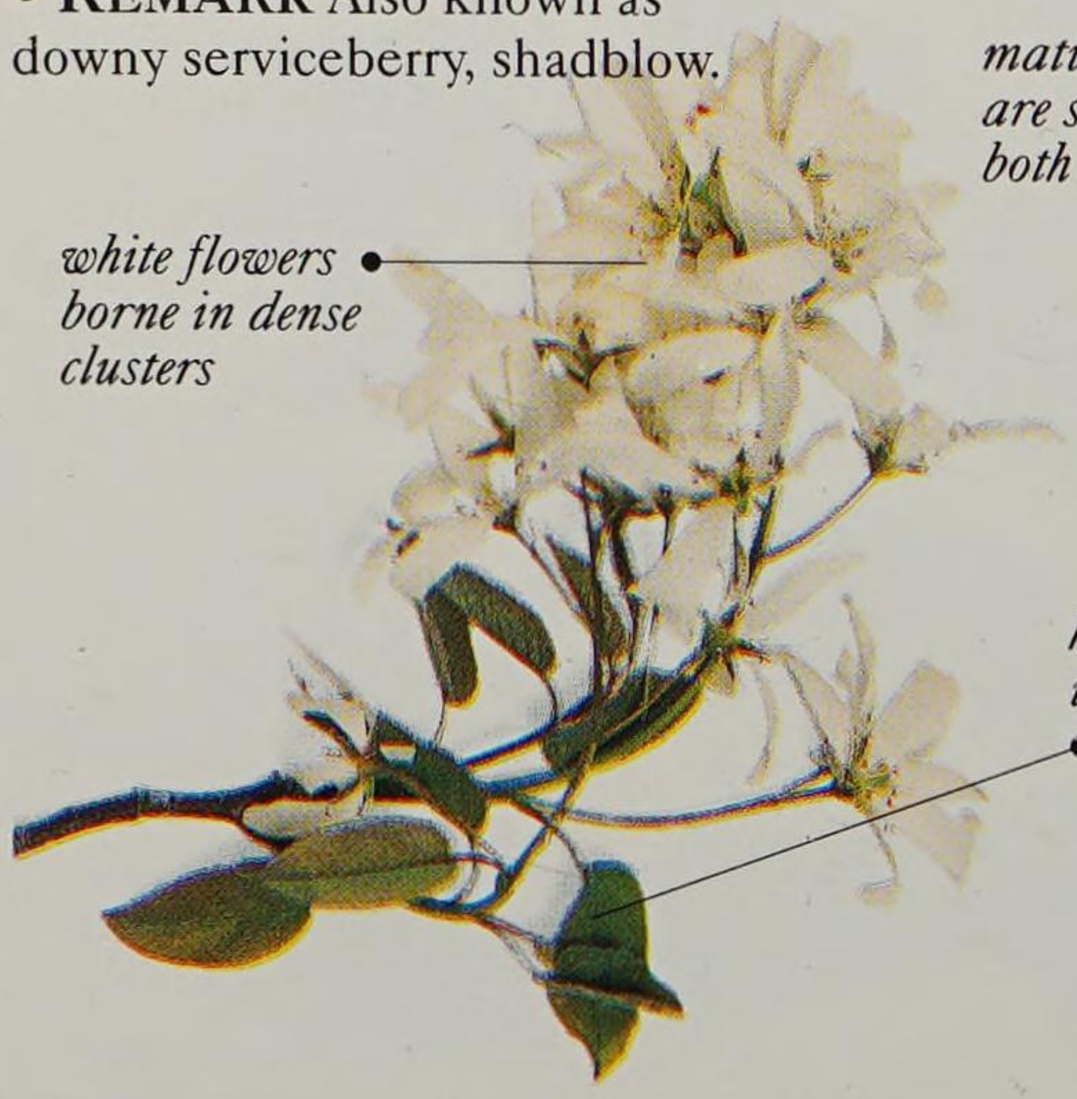
Leaves Ovate to obovate, to 3 in (7.5 cm) long and 1½ in (4 cm) across, rounded to heart-shaped at the base, usually short-pointed at the tip, finely toothed, becoming deep green above, folded and white with hairs when young becoming smooth beneath, turning orange to red in autumn. ***Bark*** Gray and smooth when young, becoming ridged and scaly with age. ***Flowers*** White, with five narrow petals, in upright racemes to 2 in (5 cm) long, in spring before the leaves are fully open. ***Fruit*** A rounded, dry or juicy, sweet, edible, reddish purple berry, to 5/16 in (8 mm) across, ripening in summer.

• **NATIVE REGION** C. and E. United States.

• **HABITAT** Woods and thickets, on moist soil.

• **REMARK** Also known as downy serviceberry, shadblow.





Height 40 ft (12 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

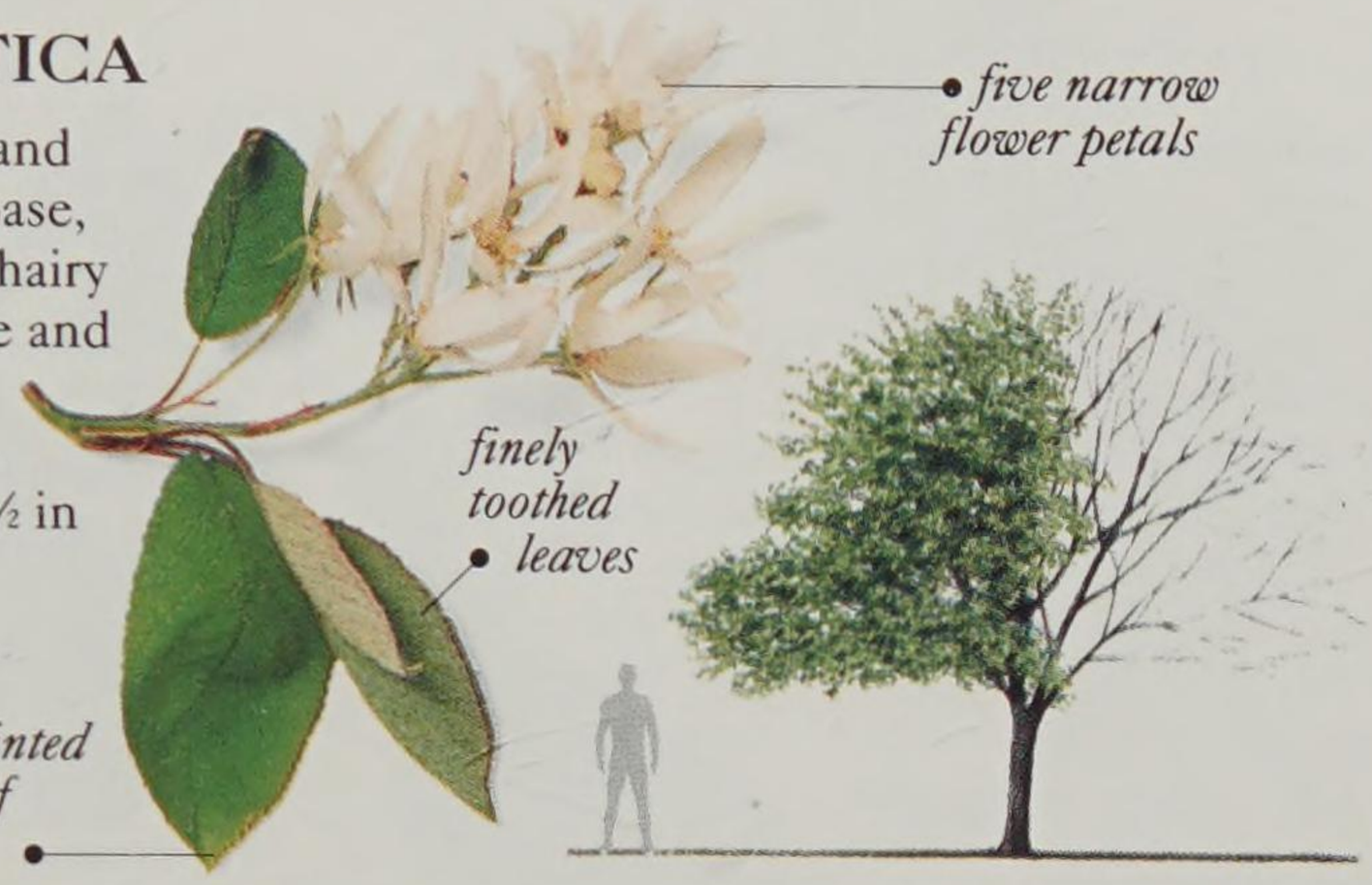
Family ROSACEAE	Species *Amelanchier asiatica*	Author (Siebold & Zuccarini) Walpers

AMELANCHIER ASIATICA

Leaves Ovate, to 3 in (7.5 cm) long and 1½ in (4 cm) across, rounded at the base, pointed, toothed, dark green above, hairy then smooth beneath, turning orange and red in autumn. ***Bark*** Gray-brown, fissured with age. ***Flowers*** White, in upright later spreading racemes to 2½ in (6 cm) long, in spring. ***Fruit*** Black-purple, to ⅜ in (1 cm) across.

• **NATIVE REGION** China, Japan, Korea.

• **HABITAT** Dry, sunny sites.



Height 40 ft (12 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

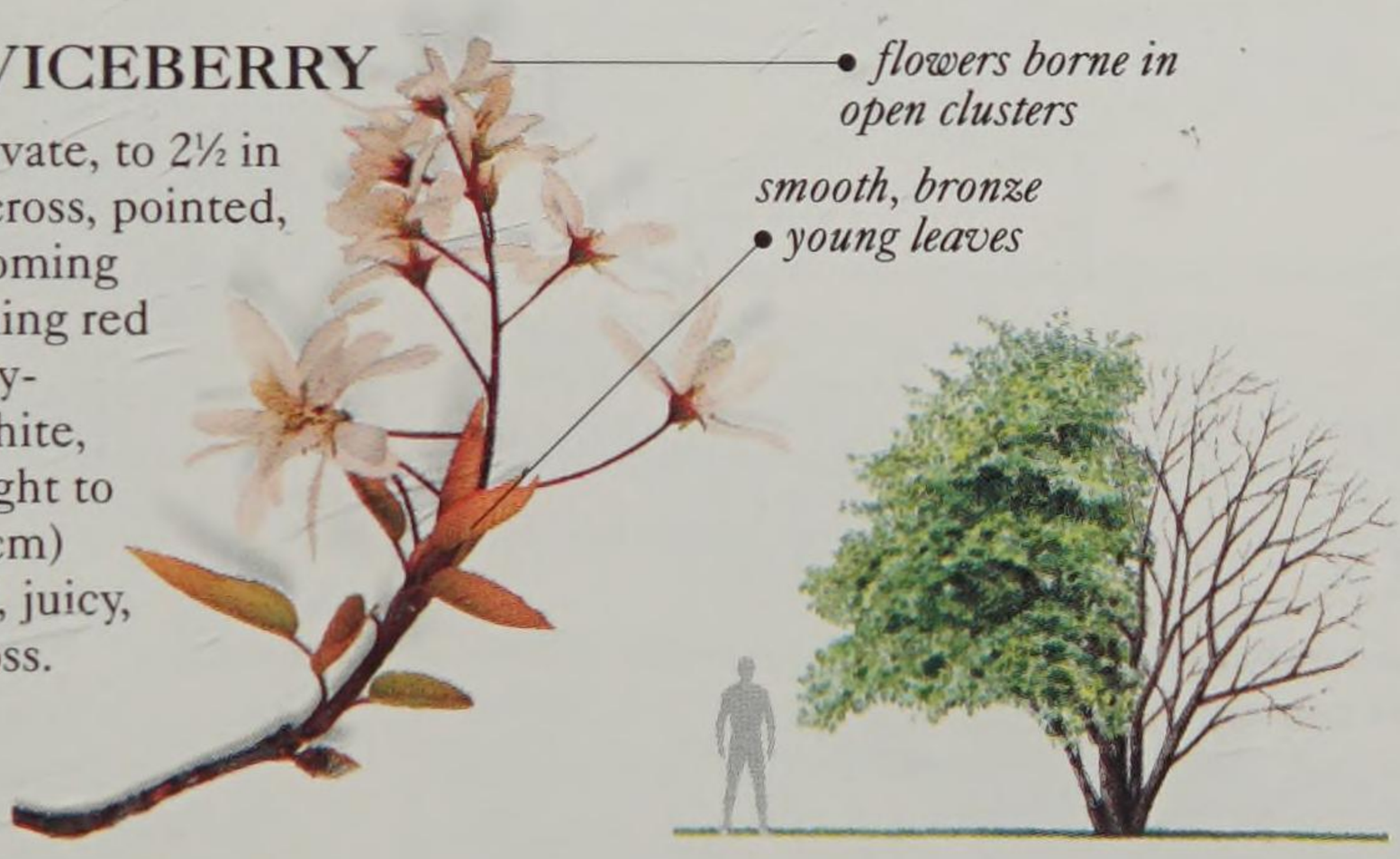
Family ROSACEAE	Species *Amelanchier laevis*	Author Wiegand

ALLEGHENY SERVICEBERRY

Leaves Elliptic to ovate or obovate, to 2½ in (6 cm) long and 1 in (2.5 cm) across, pointed, finely toothed, bronze-red becoming dark green above, smooth, turning red or orange in autumn. ***Bark*** Gray-brown and smooth. ***Flowers*** White, with five narrow petals, in upright to spreading racemes to 3 in (7.5 cm) long, in spring. ***Fruit*** Rounded, juicy, purple-black, 5/16 in (8 mm) across.

• **NATIVE REGION** E. North America.

• **HABITAT** Woods, thickets.



Height 40 ft (12 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Amelanchier lamarckii*	Author Schroeder

AMELANCHIER LAMARCKII

Leaves Ovate to elliptic, to 3 in (7.5 cm) long and 1½ in (4 cm) across, usually rounded at the base, pointed, finely toothed, bronze becoming dark green. ***Bark*** Gray, smooth, developing vertical, narrow cracks. ***Flowers*** White, with five narrow petals, borne in upright or spreading racemes to 3 in (7.5 cm) long, in spring. ***Fruit*** Rounded, juicy, and purple-black, ⅜ in (1 cm) across.

• **NATIVE REGION** Europe.

• **HABITAT** Sandy soil.

Height 40 ft (12 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Cotoneaster frigidus*	Author Wallich

COTONEASTER FRIGIDUS

Leaves Elliptic to ovate, to 4¾ in (12 cm) long and 2 in (5 cm) across, rounded at the tip, untoothed, often with a wavy margin, matte dark green and smooth above, gray and hairy at least when young beneath. ***Bark*** Gray, flaking with age. ***Flowers*** 5/16 in (8 mm) across, white, in dense, flattened heads to 4 in (10 cm) across, in midsummer. ***Fruit*** Rounded, bright red, 3/16 in (5 mm) across, borne in hanging clusters on thick stems.

• **NATIVE REGION** The Himalayas.

• **HABITAT** Thickets and riverbanks.

• **REMARK** Can be either a small tree or a large shrub.

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

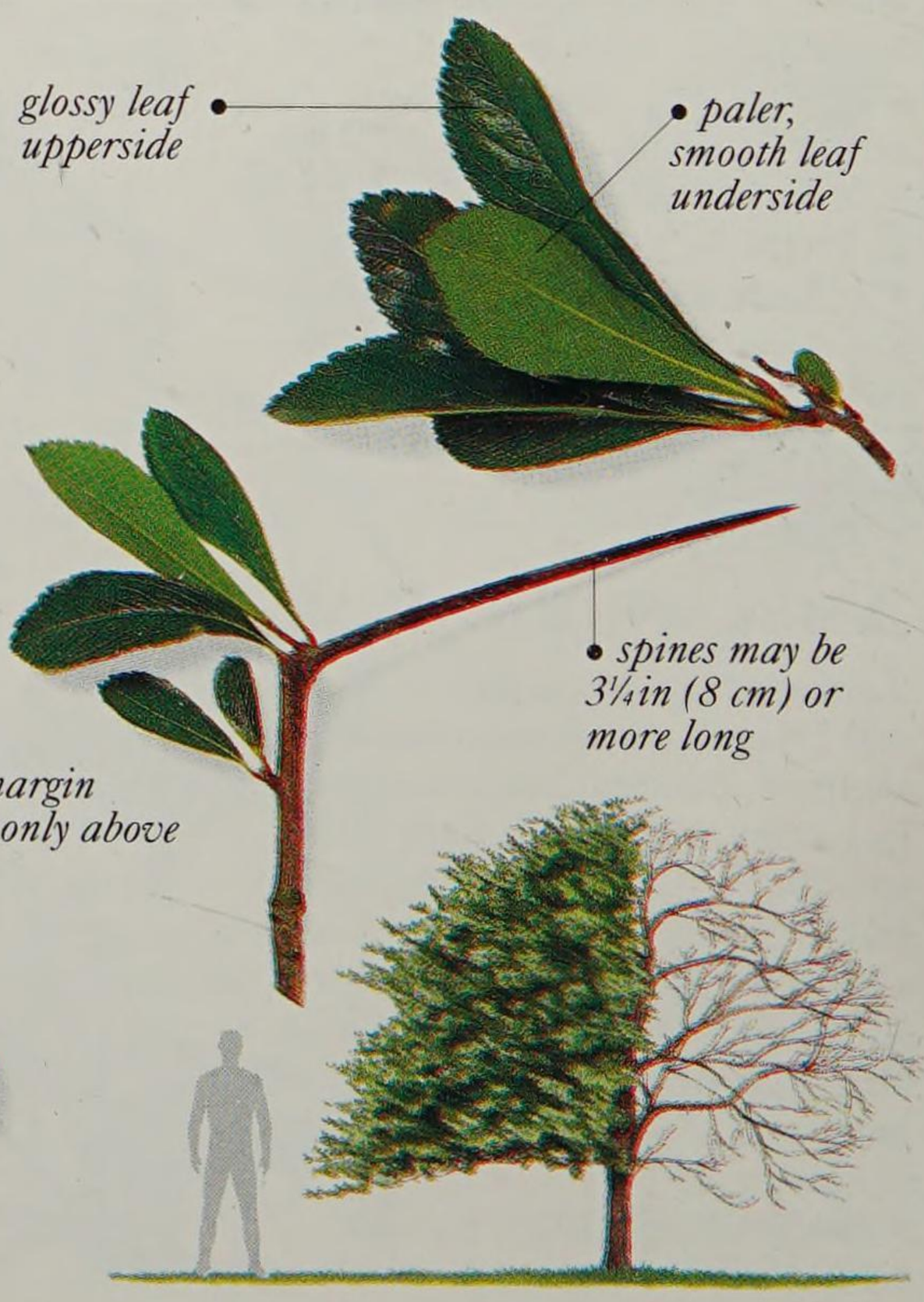
Family ROSACEAE	Species *Crataegus crus-galli*	Author Linnaeus

COCKSPUR THORN

Leaves Obovate, to 4 in (10 cm) long and 1½ in (4 cm) across, tapered at the base, rounded at the tip, toothed above the middle, glossy dark green above, paler beneath, smooth, turning orange and red in autumn, the shoots with long spines. ***Bark*** Dark brown, scaly. ***Flowers*** 5/8 in (1.5 cm) across, white, with five petals and pink anthers, in rounded heads in early summer. ***Fruit*** Rounded, fleshy, red, 3/8 in (1 cm) across.

• **NATIVE REGION** E. North America.

• **HABITAT** Thickets in dry, rocky places.



Height 26 ft (8 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

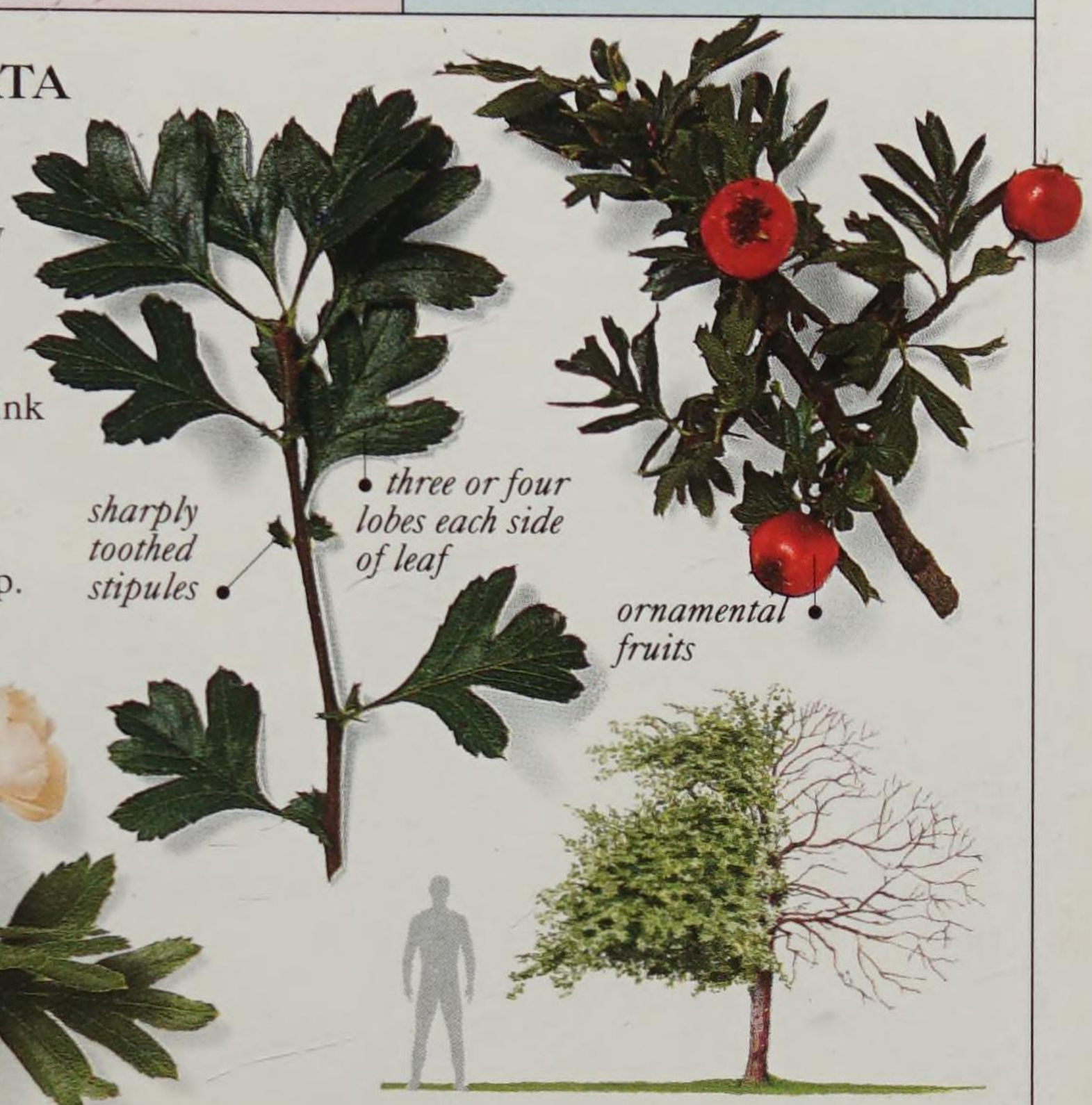
Family ROSACEAE	Species *Crataegus laciniata*	Author Ucria

CRATAEGUS LACINIATA

Leaves Diamond-shaped, to 2 in (5 cm) long and across, lobed, the lobes often toothed at the tip, glossy dark green above, gray and hairy beneath. ***Bark*** Gray, flaking in thin plates. ***Flowers*** ¾ in (2 cm) across, white, with five petals and pink anthers, in dense clusters in early summer. ***Fruit*** Rounded or slightly oblong, red or red flushed yellow, ¾ in (2 cm) long, with a flattened top.

• **NATIVE REGION** S.W. Asia, S.E. Europe.

• **HABITAT** Wood margins and thickets.



Height 20 ft (6 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Crataegus laevigata*	Author (Poiret) Candolle

ENGLISH HAWTHORN

Leaves Ovate to obovate, to 2 in (5 cm) long and across, shallowly lobed, toothed, glossy dark green above, paler beneath, becoming smooth. ***Bark*** Gray, smooth, cracking with age. ***Flowers*** ¾ in (2 cm) across, usually white, with five petals, borne in small clusters in late spring. ***Fruit*** Rounded to oval, red, to ¾ in (2 cm) long.

• **NATIVE REGION** Europe.

• **HABITAT** Woods and hedgerows.

▽ **'GIREOUDII'**
The green young leaves of this form are later followed by variegated foliage.

◁ **'PAUL'S SCARLET'**
This lovely cultivar is selected for its flowers, borne through late spring and early summer.

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

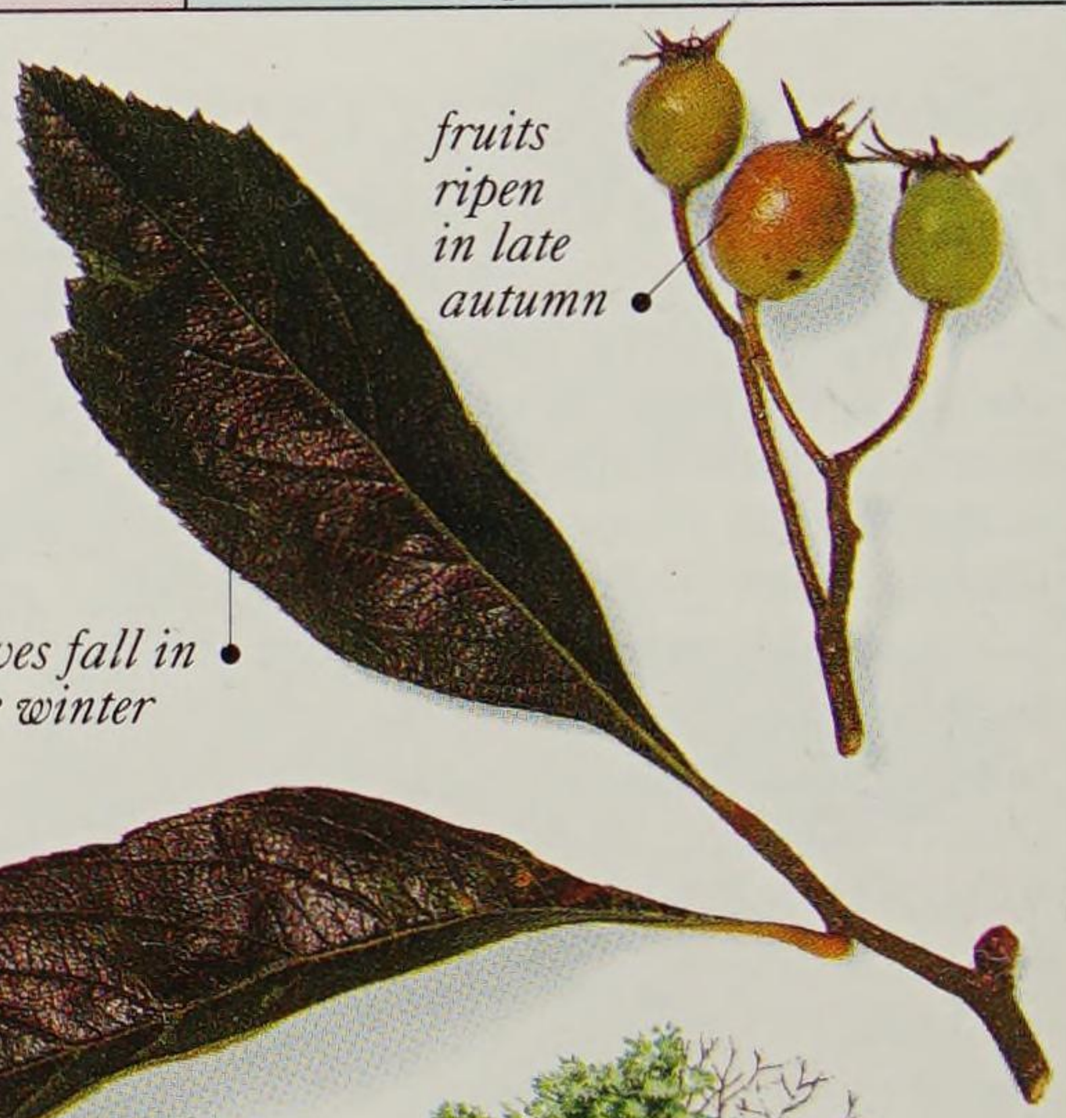
Family ROSACEAE	Species *Crataegus* x *lavallei*	Author Herincq ex Lavallée

CRATAEGUS X LAVALLEI

Leaves Obovate to elliptic, to 4 in (10 cm) long and 2 in (5 cm) across, tapered at the base, pointed at the tip, toothed, glossy dark green and smooth above, paler and hairy beneath. ***Bark*** Gray, flaking in plates. ***Flowers*** 1 in (2.5 cm) across, white, with five petals and pink anthers, in flattened heads on downy stalks in early to midsummer. ***Fruit*** Rounded, red, ¾ in (2 cm) across.

• **NATIVE REGION**
Of garden origin.

• **REMARK** A hybrid between cockspur thorn (*Crataegus crus-galli*, see p.240) and *Crataegus pubescens*, formerly known as *Crataegus carrierei*.



'CARRIEREI'

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

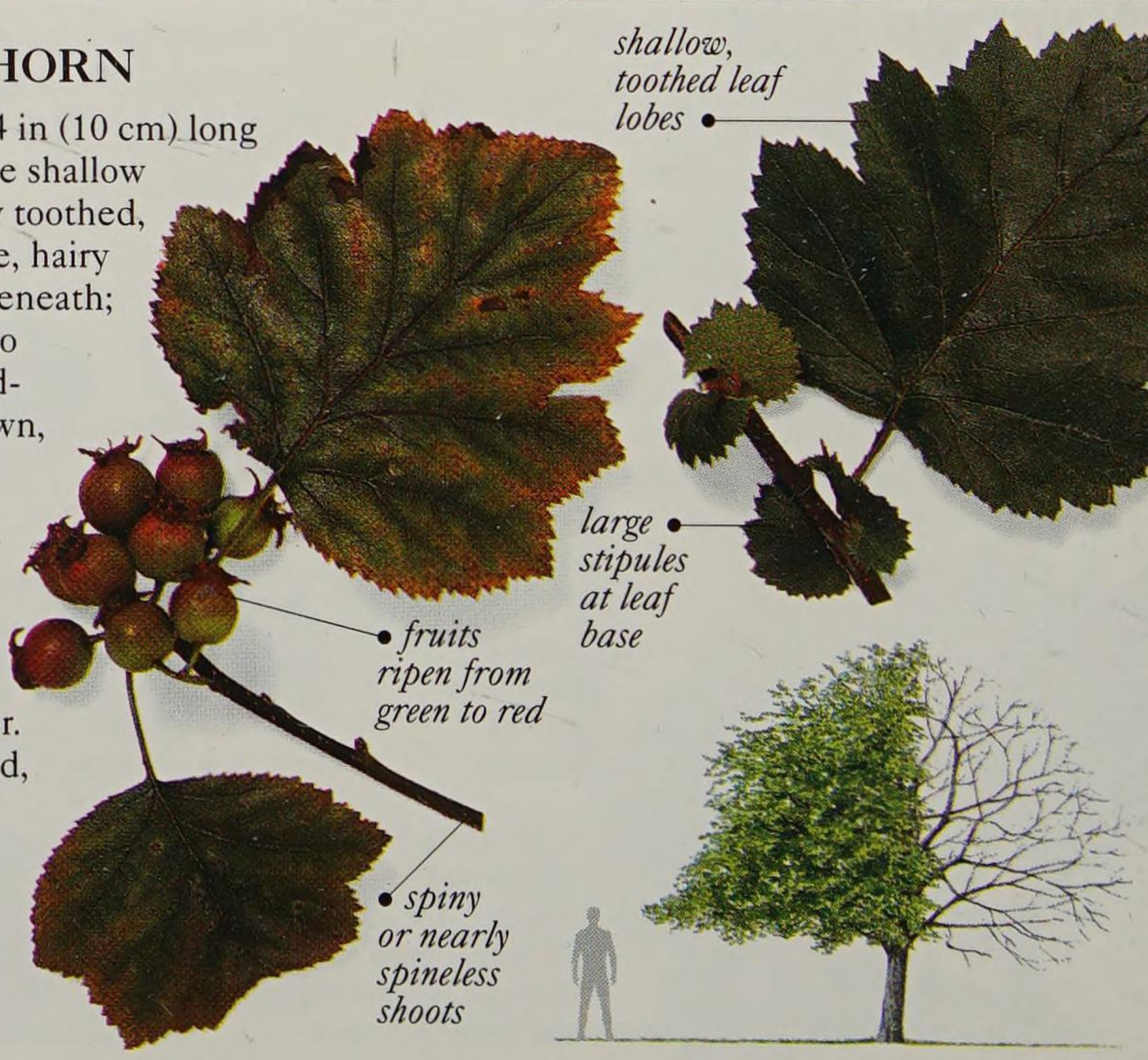
Family ROSACEAE	Species *Crataegus mollis*	Author (Torrey & Gray) Scheele

DOWNY HAWTHORN

Leaves Broadly ovate, to 4 in (10 cm) long and across, with four or five shallow lobes on each side, sharply toothed, dark green and hairy above, hairy particularly when young beneath; shoots with glossy spines to 2 in (5 cm) long. ***Bark*** Red-brown becoming gray-brown, cracking vertically into scaly plates. ***Flowers*** 1 in (2.5 cm) across, white, with five petals and yellow anthers, in broad heads on downy stalks in late spring to early summer. ***Fruit*** Rounded, downy, red, to 1 in (2.5 cm) across.

• **NATIVE REGION**
C. United States.

• **HABITAT** Near streams in woods, often on limestone.



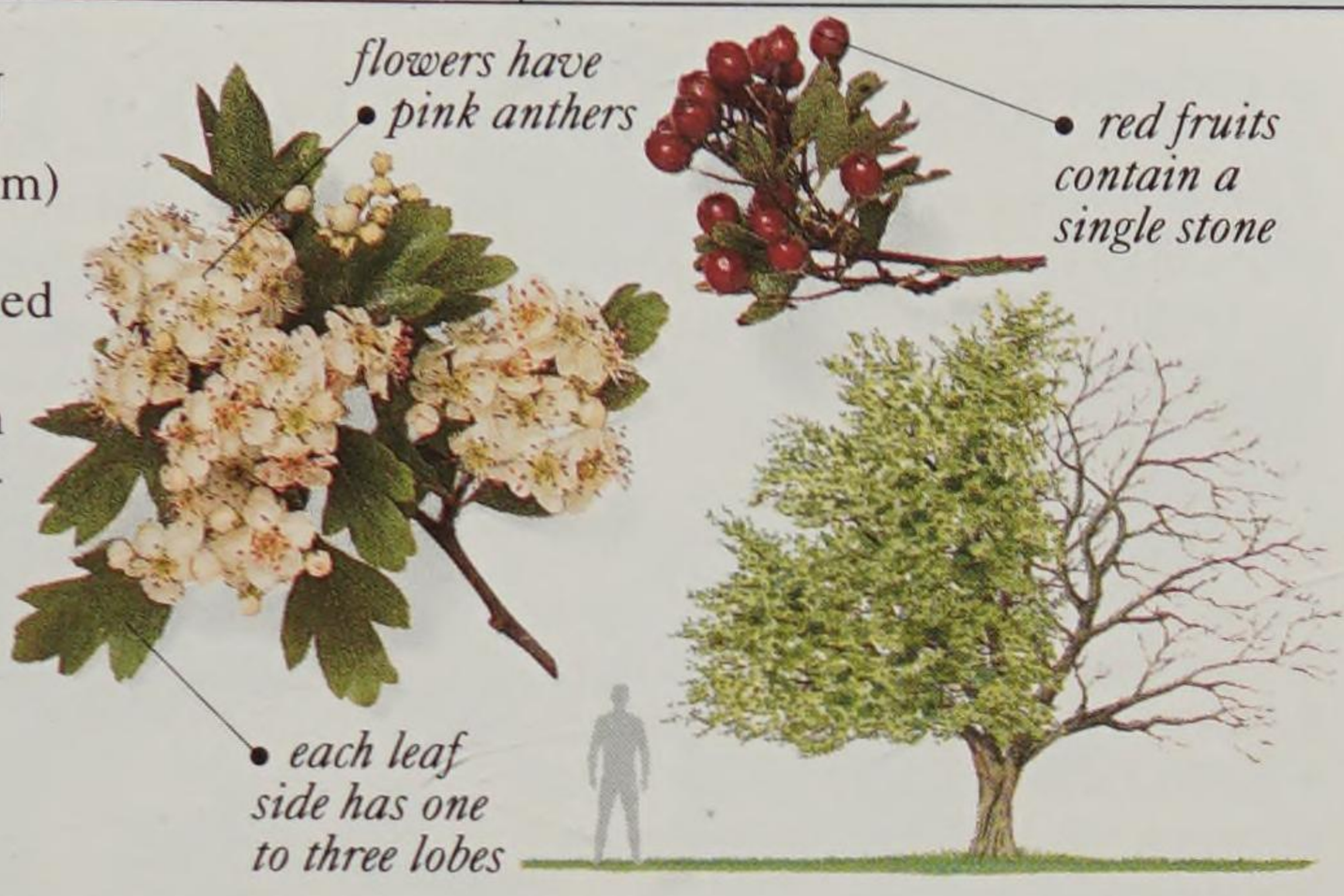
Height 40 ft (12 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Crataegus monogyna*	Author Jacquin

COMMON HAWTHORN

Leaves Ovate to obovate, to 2 in (5 cm) or more long and nearly the same across, deeply cut into pointed, toothed lobes, glossy dark green and smooth above, paler and smooth with hairs in the vein axils beneath. ***Bark*** Orange-brown, cracking. ***Flowers*** To ⅝ in (1.5 cm) across, white, in clusters in late spring. ***Fruit*** Oval, red, to ½ in (1.2 cm) across.

- **NATIVE REGION** Europe.
- **HABITAT** Woods and thickets.



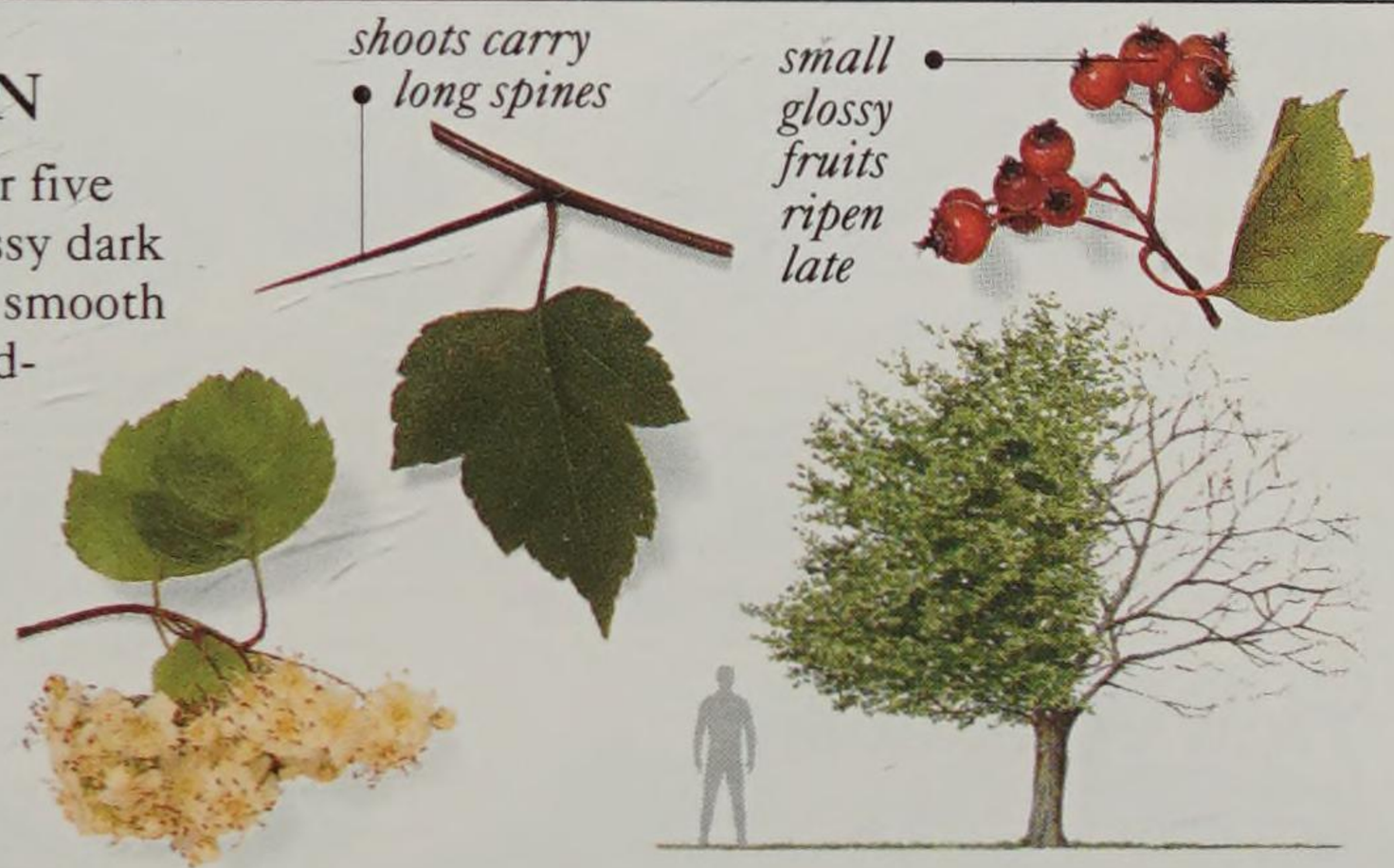
Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Crataegus phaenopyrum*	Author Linnaeus f.

WASHINGTON THORN

Leaves Broadly ovate, with three or five pointed, sharply toothed lobes, glossy dark green and smooth above, paler and smooth or sparsely hairy beneath. ***Bark*** Red-brown to gray-brown, thin, scaly. ***Flowers*** ½ in (1.2 cm) across, with five petals, in clusters in early to midsummer. ***Fruit*** Rounded, small, red, ¼ in (6 mm) across.

- **NATIVE REGION** S.E. United States.
- **HABITAT** Woods and thickets.



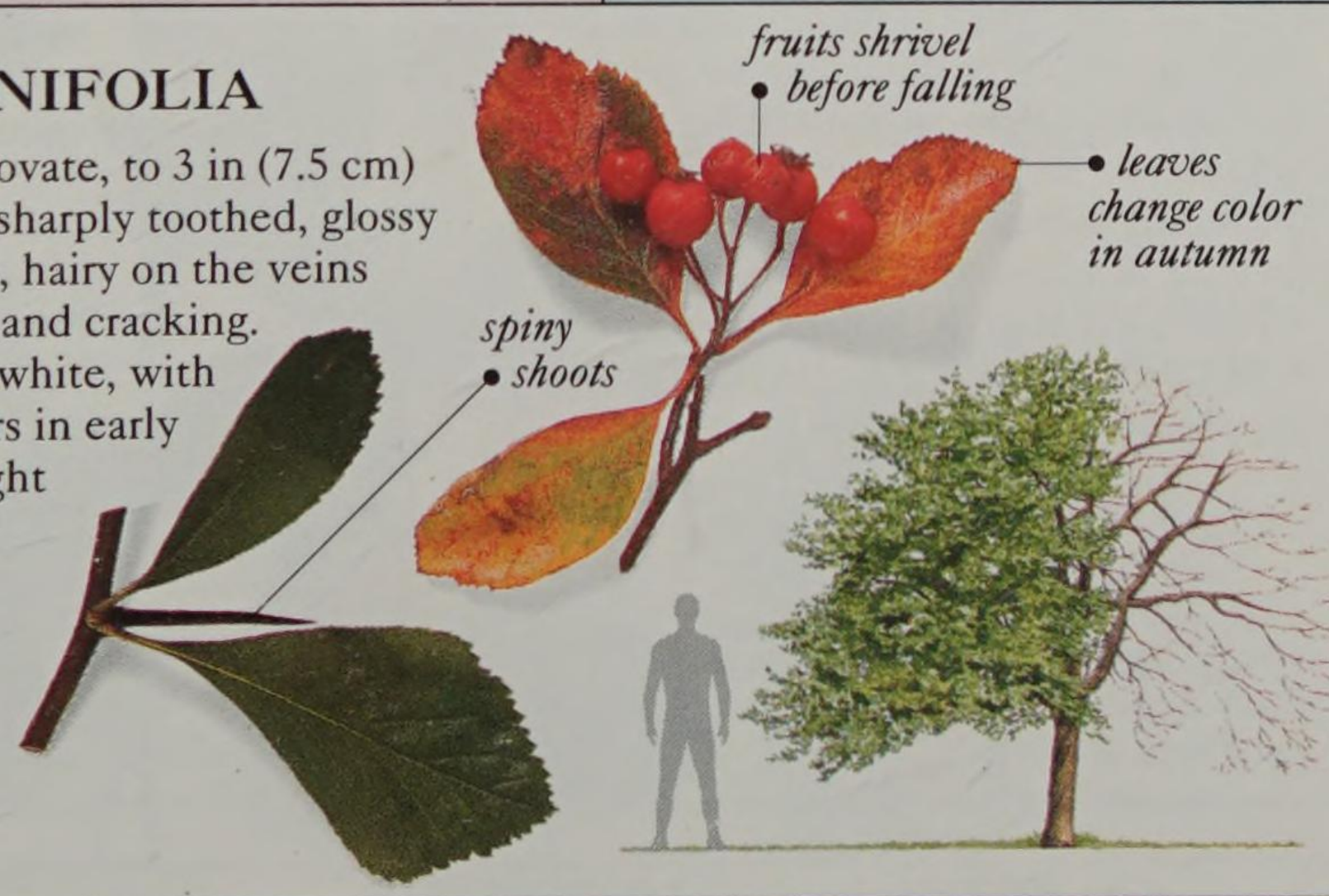
Height 40 ft (12 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Crataegus prunifolia*	Author (Lamarck) Persoon

CRATAEGUS PRUNIFOLIA

Leaves Broadly elliptic to obovate, to 3 in (7.5 cm) long and 2½ in (6 cm) across, sharply toothed, glossy dark green and smooth above, hairy on the veins beneath. ***Bark*** Purple-brown and cracking. ***Flowers*** ⅝ in (1.5 cm) across, white, with five petals, in rounded clusters in early summer. ***Fruit*** Rounded, bright red, ⅝ in (1.5 cm) across.

- **NATIVE REGION** Of garden origin.
- **REMARK** Possibly a hybrid between cockspur thorn *(C. crus-galli*, see p.240) and *C. macracantha*.



Height 20 ft (6 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species x *Crataemespilus grandiflora*	Author (W.W. Smith) E.G. Camus

x CRATAEMESPILUS GRANDIFLORA

Leaves Elliptic to obovate, to 3 in (7.5 cm) long and 2 in (5 cm) across, glossy green above, turning bright orange in autumn; on vigorous shoots deeply lobed. ***Bark*** Pale orange-brown, flaking in thin plates. ***Flowers*** 1 in (2.5 cm) across, white, with five petals, borne in clusters of up to three in late spring. ***Fruit*** Rounded, slightly hairy, glossy orange-brown, ¾ in (2 cm) across.

• **NATIVE REGION** Of garden origin.

• **REMARK** Thought to be a hybrid between the Midland hawthorn *(Crataegus laevigata*, see p.241) and the medlar *(Mespilus germanica*, see p.255).

x CRATAEMESPILUS Δ GRANDIFLORA

+ CRATAEGOMESPILUS ∇ DARDARII 'JULES D'ASNIÈRES'
This graft hybrid has rounded leaf lobes, smaller flowers, and small, brown fruits.

Height 26 ft (8 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

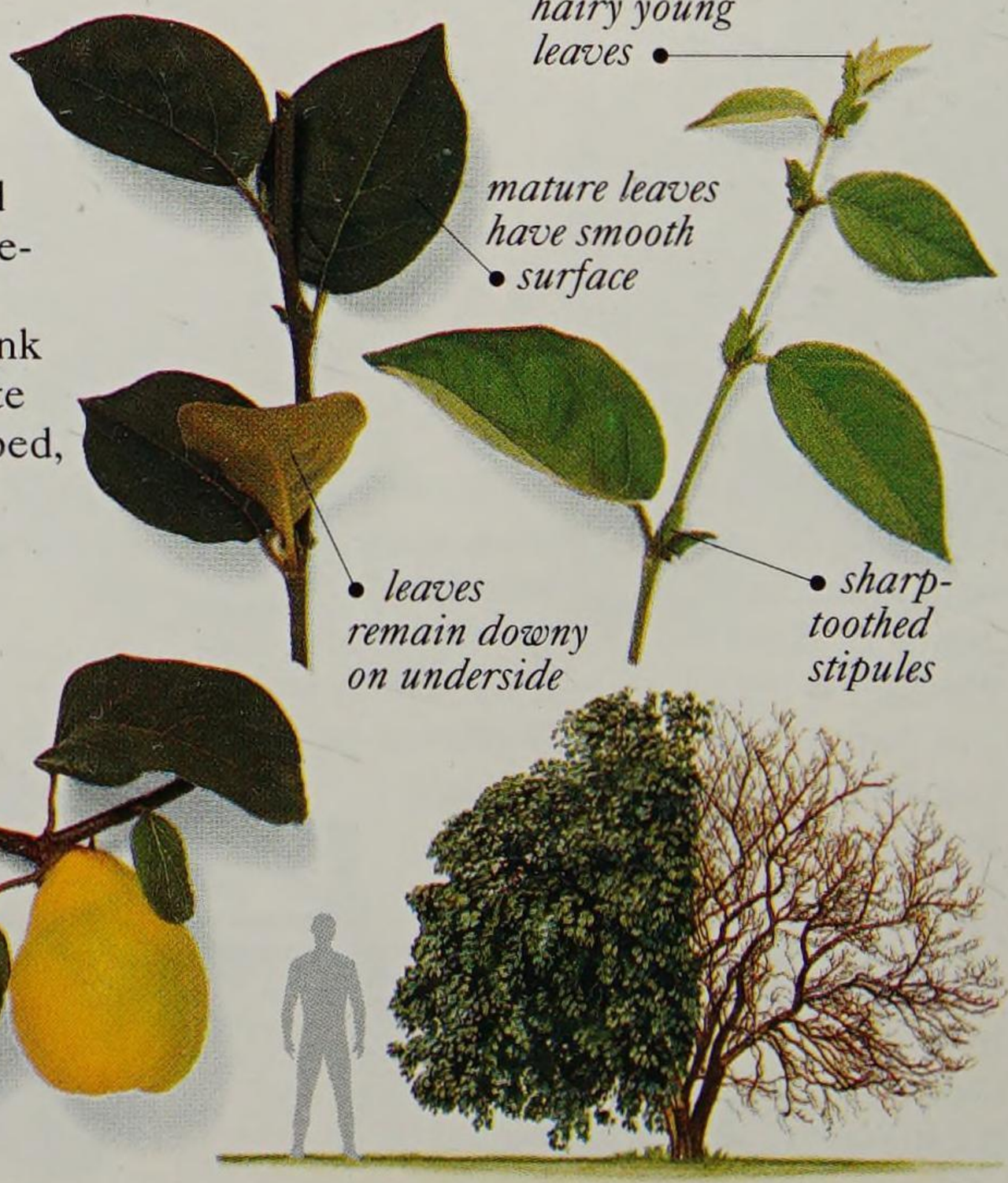
Family ROSACEAE	Species *Cydonia oblonga*	Author Miller

QUINCE

Leaves Broadly elliptic to ovate, to 4 in (10 cm) long and 2½ in (6 cm) across, untoothed, grayish white and downy when young becoming dark green above, gray and downy beneath, on short stalks. ***Bark*** Purple-brown, flaking; orange-brown when freshly exposed. ***Flowers*** 2 in (5 cm) across, pale pink or white, with five petals, borne singly in late spring. ***Fruit*** Pear- or sometimes apple-shaped, yellow, to 4 in (10 cm) long, downy at first becoming oily to the touch, very fragrant; on wild plants much smaller.

• **NATIVE REGION** C. and S.W. Asia.

• **HABITAT** Wood margins, forests, and mountain slopes, often on limestone.



Height 17 ft (5 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Malus baccata*	Author (Linnaeus) Borkhausen

SIBERIAN CRAB APPLE

Leaves Elliptic to ovate, to 3 in (7.5 cm) long and 1½ in (4 cm) across, tapered to a pointed tip, finely toothed, dark green above, paler beneath, smooth on both sides. ***Bark*** Gray-brown, flaking in square plates; red-brown when freshly exposed. ***Flowers*** Individually to 1½ in (4 cm) across, white tinged pink opening white, with five petals and yellow anthers, fragrant, borne in clusters in mid-spring at the same time as the young leaves emerge. ***Fruit*** Rounded, small, red or yellow, ⅜ in (1 cm) across.

• **NATIVE REGION**
E. Asia.

• **HABITAT** Woods and scrub.

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

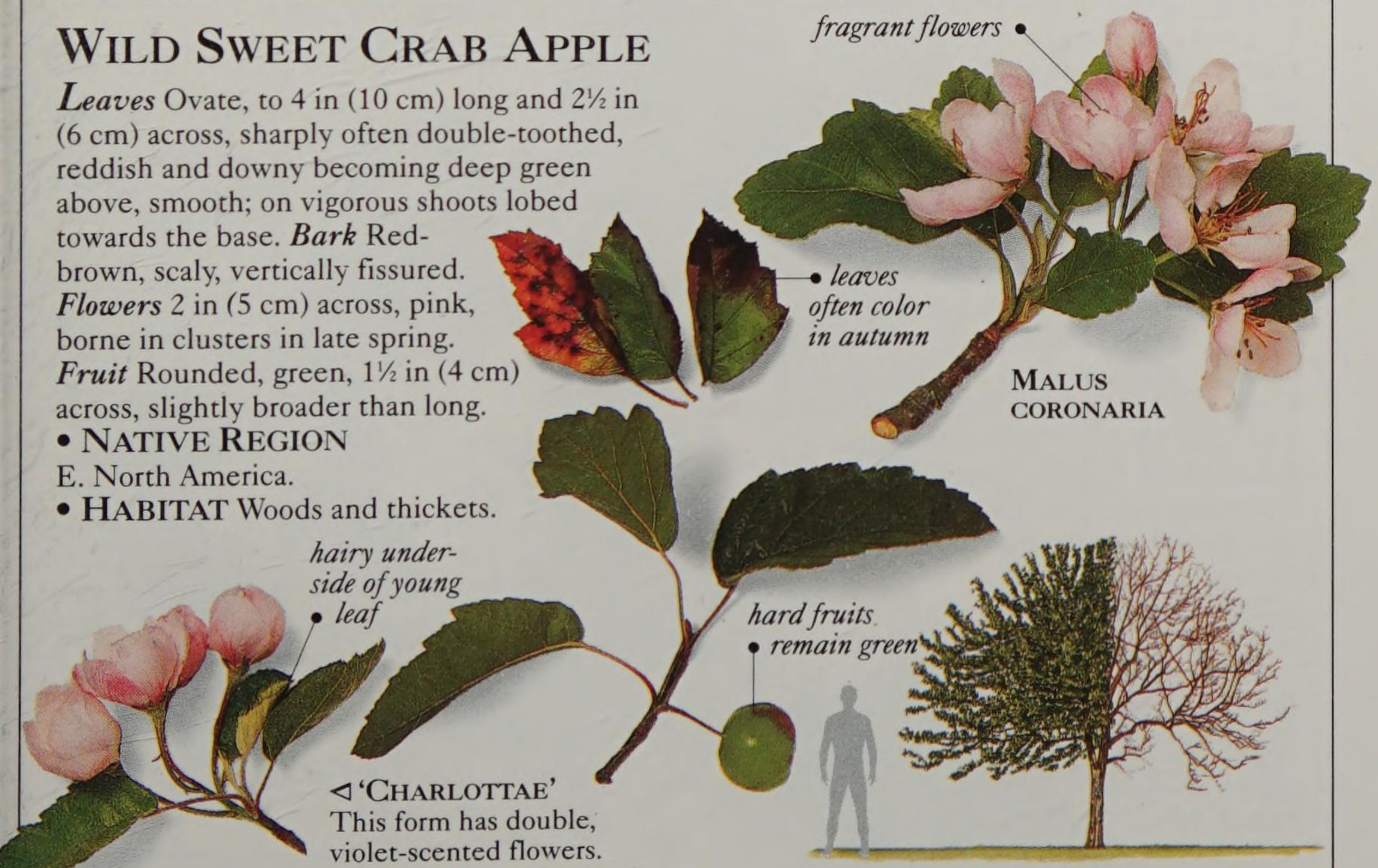
Family ROSACEAE	Species *Malus coronaria*	Author (Linnaeus) Miller

WILD SWEET CRAB APPLE

Leaves Ovate, to 4 in (10 cm) long and 2½ in (6 cm) across, sharply often double-toothed, reddish and downy becoming deep green above, smooth; on vigorous shoots lobed towards the base. ***Bark*** Red-brown, scaly, vertically fissured. ***Flowers*** 2 in (5 cm) across, pink, borne in clusters in late spring. ***Fruit*** Rounded, green, 1½ in (4 cm) across, slightly broader than long.

• **NATIVE REGION**
E. North America.

• **HABITAT** Woods and thickets.



◁ **'CHARLOTTAE'**
This form has double, violet-scented flowers.

Height 30 ft (9 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

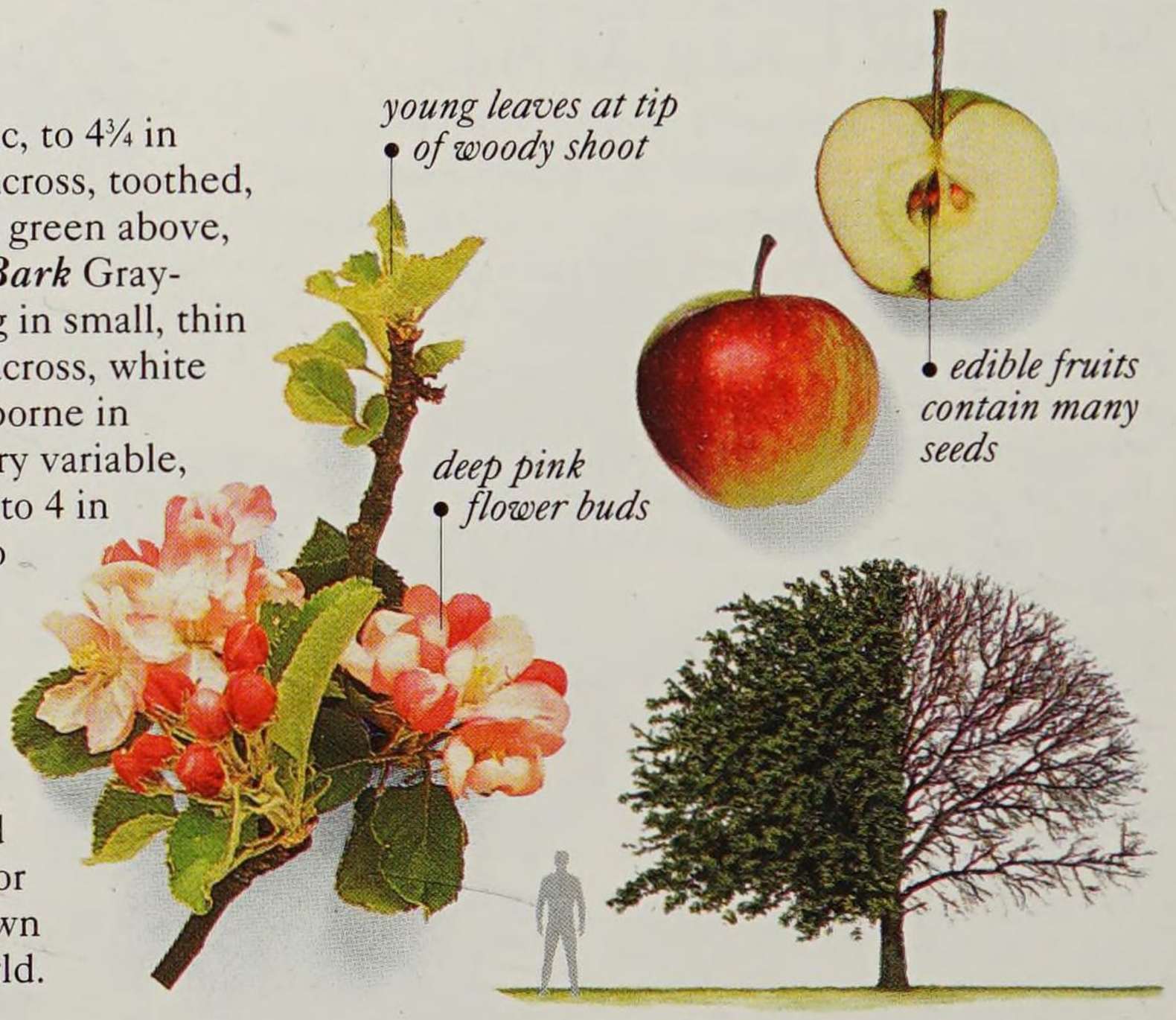
Family ROSACEAE	Species *Malus domestica*	Author Borkhausen

COMMON APPLE

Leaves Ovate to broadly elliptic, to 4¾ in (12 cm) long and 3 in (7.5 cm) across, toothed, yellowish green becoming dark green above, usually hairy at least beneath. ***Bark*** Gray-brown to purple-brown, peeling in small, thin flakes. ***Flowers*** To 2 in (5 cm) across, white flushed pink, with five petals, borne in clusters in late spring. ***Fruit*** Very variable, rounded, sweet to sour, edible, to 4 in (10 cm) or more across, green to yellow or variously streaked with, to entirely, red.

• **NATIVE REGION**
Of garden origin.

• **REMARK** A hybrid involving several European and Asian species, long cultivated for its edible fruit, now widely grown in temperate regions of the world.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Malus florentina*	Author (Zuccagni) Schneider

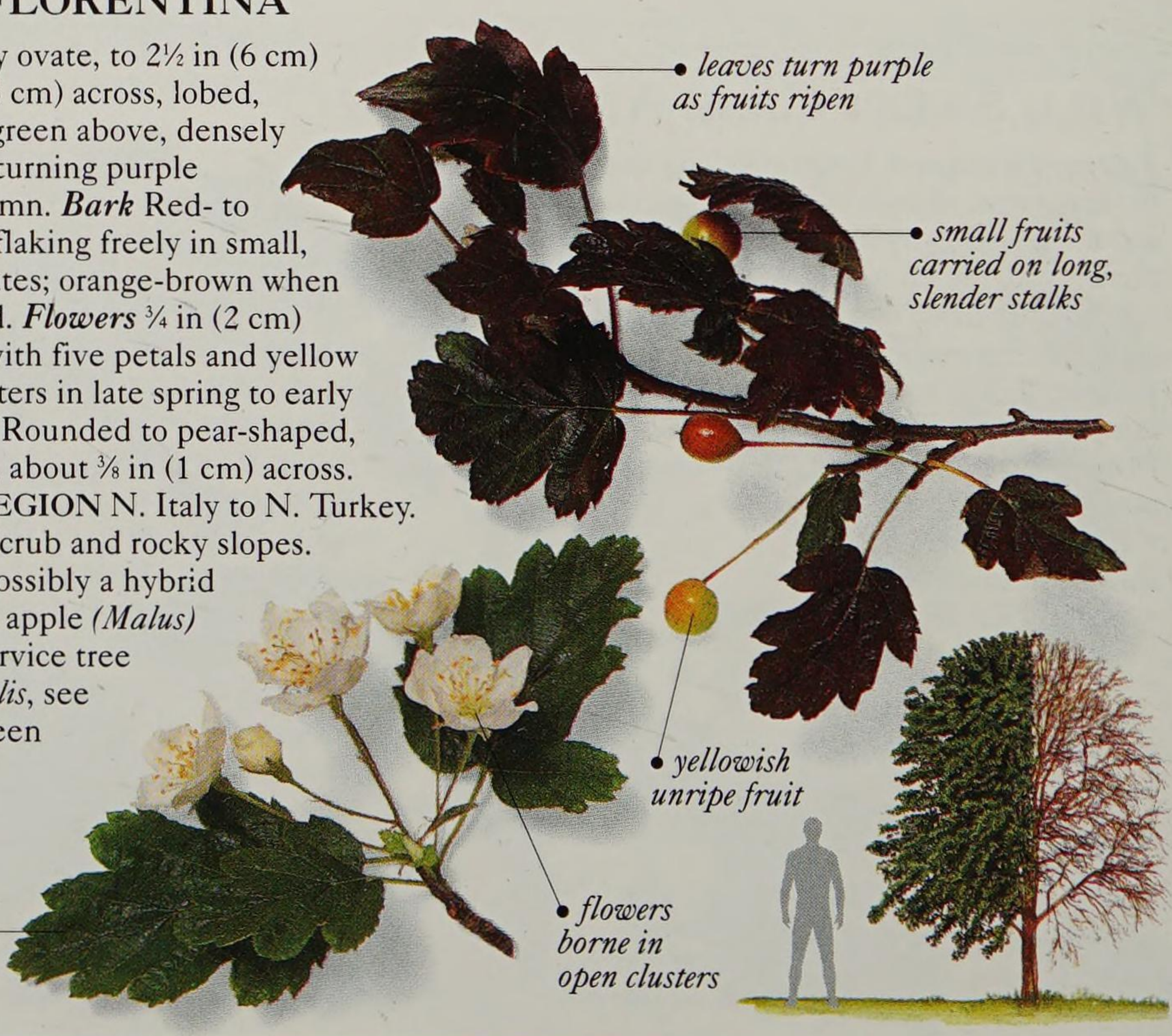
MALUS FLORENTINA

Leaves Broadly ovate, to 2½ in (6 cm) long and 2 in (5 cm) across, lobed, toothed, deep green above, densely hairy beneath, turning purple and red in autumn. ***Bark*** Red- to purple-brown, flaking freely in small, thin, square plates; orange-brown when freshly exposed. ***Flowers*** ¾ in (2 cm) across, white, with five petals and yellow anthers, in clusters in late spring to early summer. ***Fruit*** Rounded to pear-shaped, reddish orange, about ⅜ in (1 cm) across.

• **NATIVE REGION** N. Italy to N. Turkey.

• **HABITAT** Scrub and rocky slopes.

• **REMARK** Possibly a hybrid between a crab apple *(Malus)* and the wild service tree *(Sorbus torminalis*, see p.282), rarely seen in the wild.



Height 26 ft (8 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Malus floribunda*	Author Siebold ex van Houtte

JAPANESE CRAB APPLE

Leaves Elliptic, to 4 in (10 cm) long and 2 in (5 cm) across, taper-pointed, sharply toothed, dark green and smooth above, hairy when young beneath; on vigorous shoots sometimes lobed. ***Bark*** Purple-brown, flaking in thin plates with age. ***Flowers*** 1 in (2.5 cm) across, deep red in bud opening pale pink becoming white, with five petals, very profuse, borne in clusters in mid-spring. ***Fruit*** Rounded and yellow, ¾ in (2 cm) across.

• **NATIVE REGION** Of garden origin.

• **REMARK** A hybrid of unknown origin, introduced to the West from Japan.

Height 17 ft (5 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

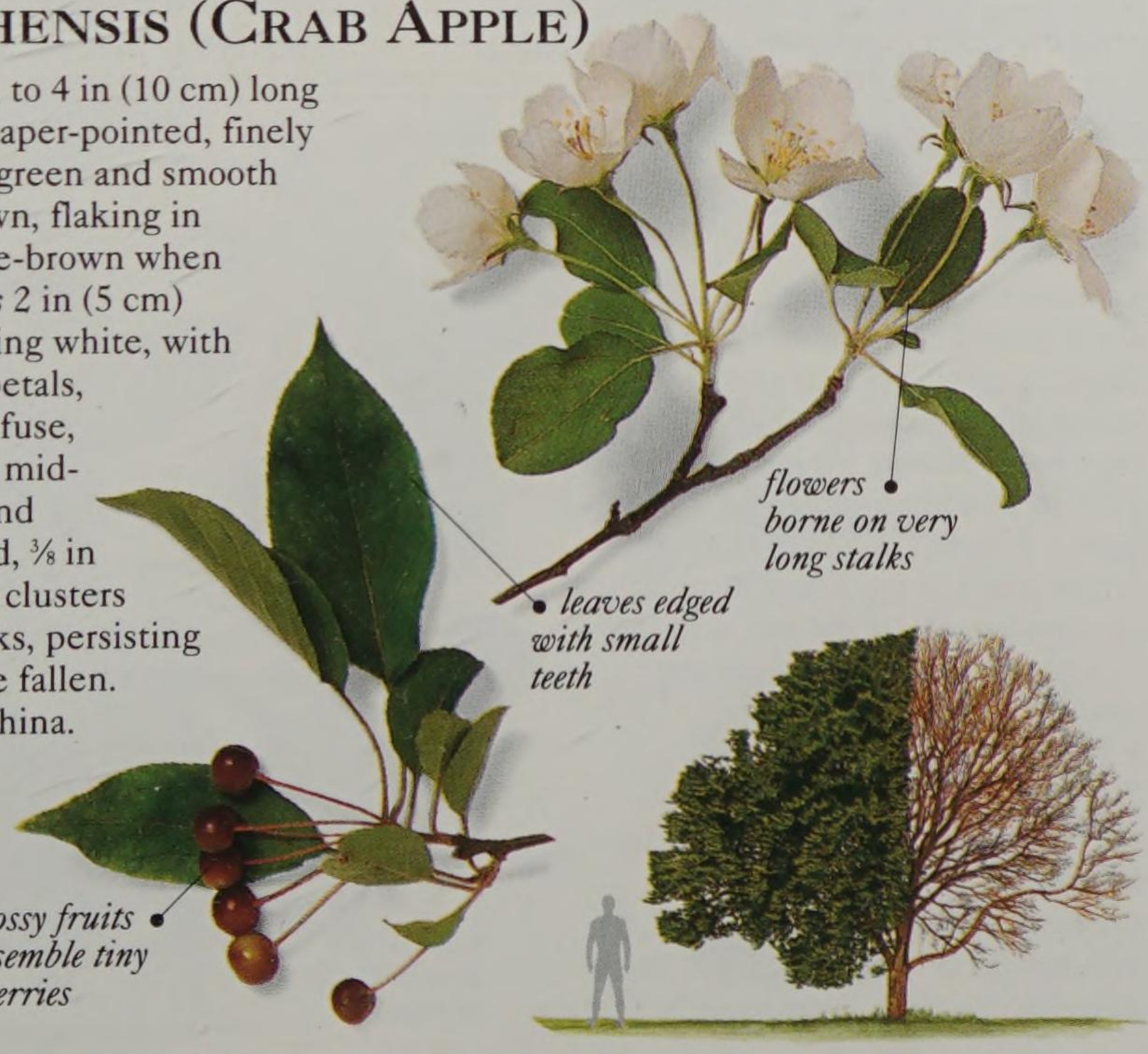
Family ROSACEAE	Species *Malus hupehensis*	Author (Pampanini) Rehder

MALUS HUPEHENSIS (CRAB APPLE)

Leaves Elliptic to ovate, to 4 in (10 cm) long and 2¼ in (6 cm) across, taper-pointed, finely toothed, becoming dark green and smooth above. ***Bark*** Purple-brown, flaking in rectangular plates; orange-brown when freshly exposed. ***Flowers*** 2 in (5 cm) across, pink in bud opening white, with five broad, overlapping petals, fragrant, usually very profuse, borne in large clusters in mid-spring. ***Fruit*** Rounded and rather flattened, deep red, ⅜ in (1 cm) across, hanging in clusters on long, slender, red stalks, persisting long after the leaves have fallen.

• **NATIVE REGION** China.

• **HABITAT** Mountain woodlands.



Height 40 ft (12 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Malus ioensis*	Author (Wood) Britton

PRAIRIE CRAB APPLE

Leaves Broadly ovate, to 4 in (10 cm) long and 2 in (5 cm) across, shallowly lobed, toothed, glossy green above, downy beneath, turning bright orange-red in autumn. ***Bark*** Reddish to purplish brown, and flaking. ***Flowers*** Pink to white, with five petals, borne in clusters of up to six in spring. ***Fruit*** Rounded, smooth, hard, and acid, pale green or green flushed red, 1½ in (4 cm) across.

• **NATIVE REGION** C. United States.

• **HABITAT** Moist streambanks and wood margins.

∇ 'PLENA'
Known as Bechtel's crab, this form has semidouble flowers, which fade from pink to white.

Height 26 ft (8 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

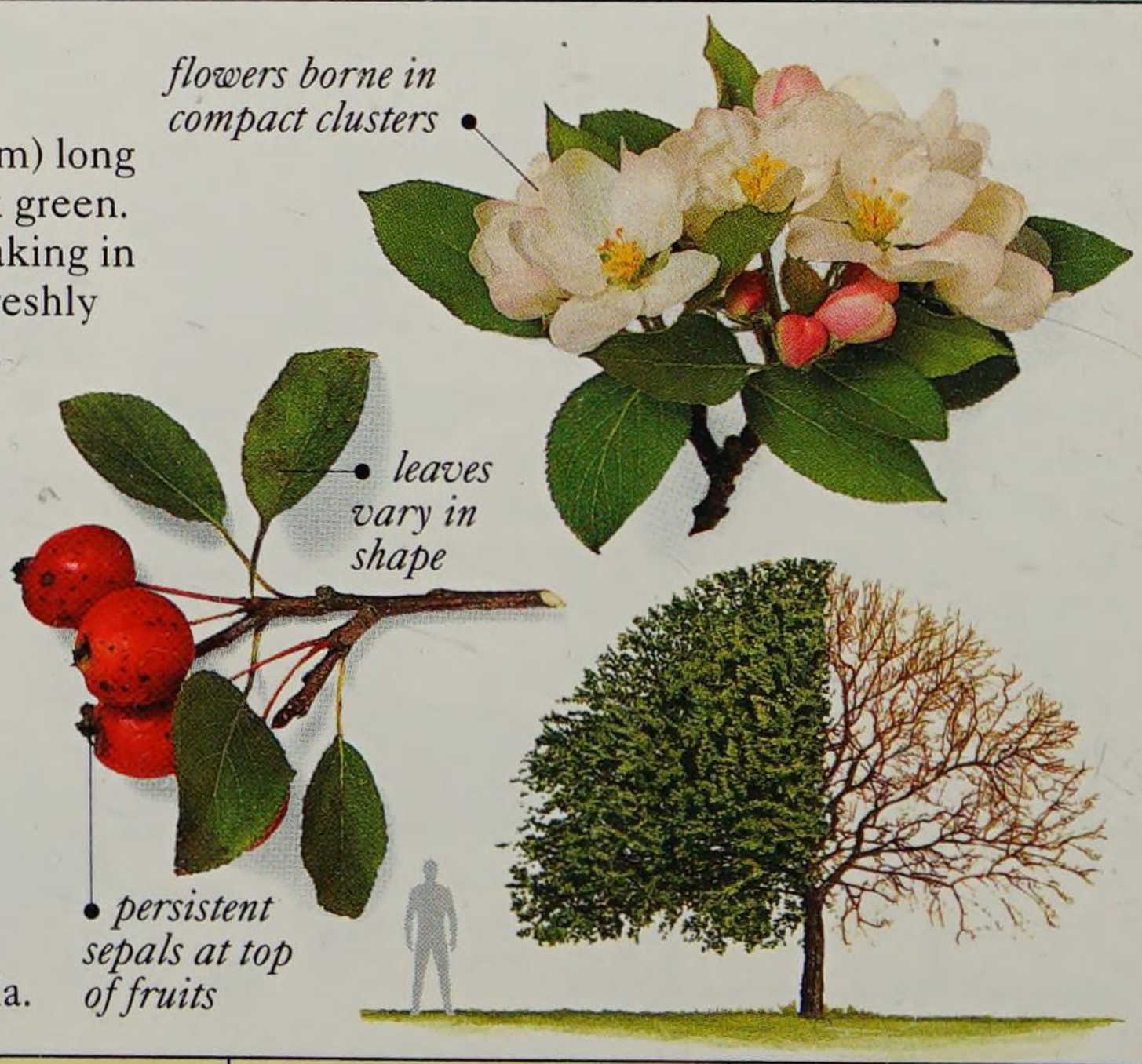
Family ROSACEAE	Species *Malus prunifolia*	Author (Willdenow) Borkhausen

MALUS PRUNIFOLIA

Leaves Elliptic to ovate, to 4 in (10 cm) long and 2½ in (6 cm) across, toothed, dark green. ***Bark*** Purple-brown to gray-brown, flaking in rectangular plates; red-brown when freshly exposed. ***Flowers*** 1½ in (4 cm) across, pink in bud opening white, with five petals, fragrant, in clusters of up to ten in mid-spring. ***Fruit*** Rounded to egg-shaped, bright red, 1 in (2.5 cm) across, with persistent, woolly sepals at the top.

• **NATIVE REGION** Of garden origin.

• **REMARK** Also known as plum-leaved crab apple. Although its precise origin is not established, this hybrid is thought to have been introduced to the West from N.E. Asia.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Malus x purpurea*	Author (Barbier) Rehder

MALUS X PURPUREA

Leaves Elliptic to narrowly ovate, to 3 in (7.5 cm) long, pointed, toothed, purplish green. ***Bark*** Purple-brown, cracked, flaking. ***Flowers*** 1½ in (4 cm) across, opening deep purple-pink, borne in clusters in spring. ***Fruit*** Rounded, deep reddish purple, 1 in (2.5 cm) across.

• **NATIVE REGION**
Of garden origin.

• **REMARK** A hybrid between *M.* x *atrosanguinea* and *M. niedzwetzkyana*.

Height 26 ft (8 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Malus sieboldii*	Author (Regel) Rehder

TORINGO CRAB APPLE

Leaves Elliptic to ovate, to 2½ in (6 cm) long and 1¼ in (3 cm) across, taper-pointed, toothed, matte deep green above, paler beneath, downy on both sides when young becoming nearly smooth; on vigorous shoots with three to five lobes. ***Bark*** Dark gray, cracking into small plates. ***Flowers*** ¾ in (2 cm) across, pink in bud opening white, with five petals, fragrant, in small clusters in mid-spring. ***Fruit*** Rounded, red or yellow, ⅜ in (1 cm) across, with no sepals when ripe, on slender stalks, persisting for some time.

• **NATIVE REGION** Japan.

• **HABITAT** Moist, sunny situations.

Height 33 ft (10 m)	Shape Broadly weeping	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Malus transitoria*	Author (Batalin) Schneider

MALUS TRANSITORIA

Leaves Variable, small and oblong, to 1 in (2.5 cm) long on short shoots, larger, to 3 in (7.5 cm) long and 2½ in (6 cm) across on vigorous shoots, deeply cut into three lobes, the central lobe with a lobe on each side, sharply toothed, bright green above, paler beneath, thinly hairy. ***Bark*** Purple-brown, cracking into smooth, vertical, rectangular plates. ***Flowers*** ¾ in (2 cm) across, white, with five petals, in small clusters in late spring. ***Fruit*** Tiny, yellow, 5/16 in (8 mm) across, slightly flattened, carried on slender, red stalks.

- **NATIVE REGION** N.W. China.
- **HABITAT** Woods and thickets.

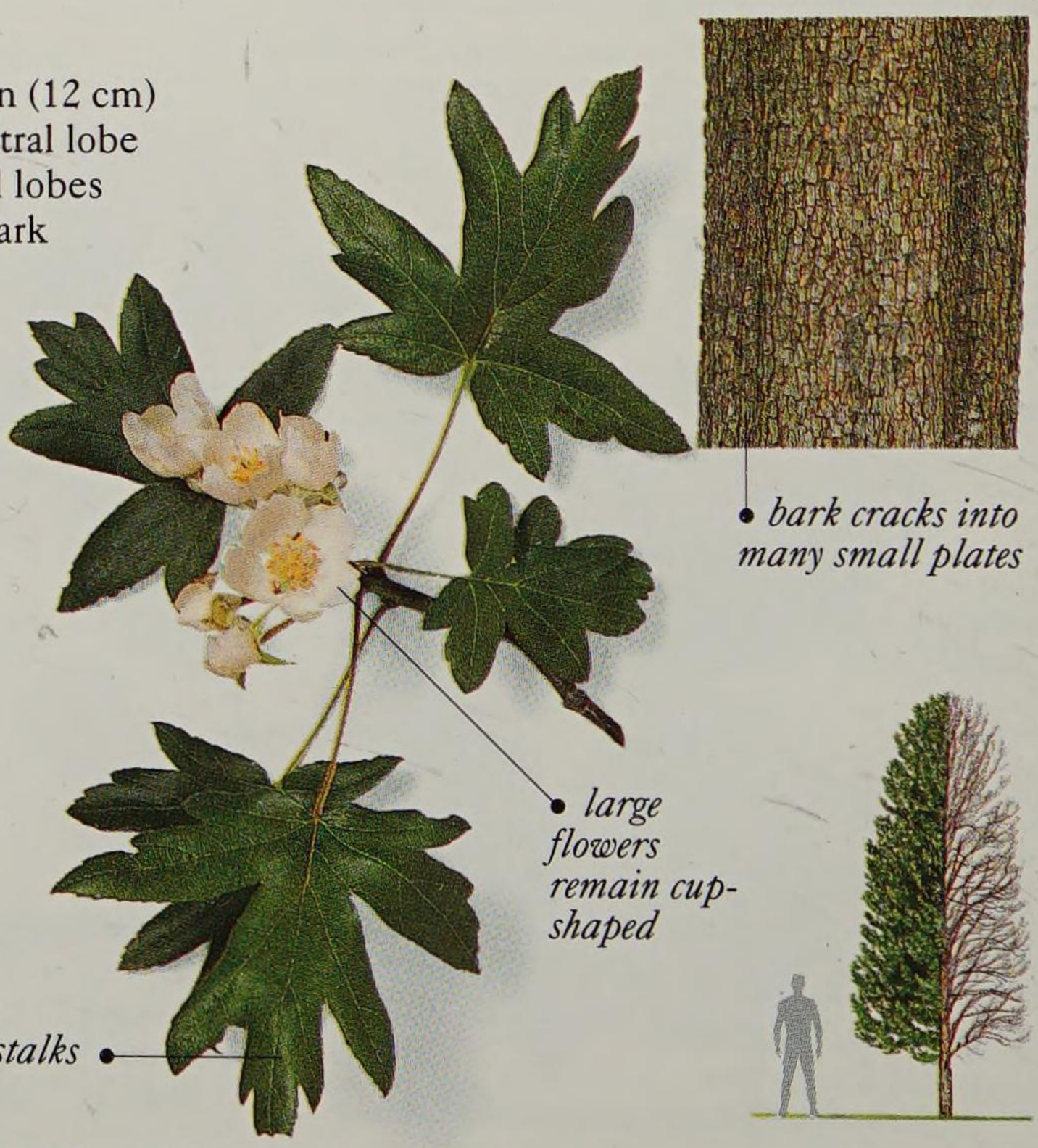
Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Malus trilobata*	Author (Labillardière) Schneider

MALUS TRILOBATA

Leaves To 3½ in (9 cm) long and 4¾ in (12 cm) across, with three deep lobes, the central lobe cut into three or more lobes, the basal lobes each with one or more lobes, glossy dark green and smooth above, paler and hairy beneath, turning yellow, red, and purple in autumn. ***Bark*** Dark gray-brown, cracking into numerous small squares, on a fluted trunk. ***Flowers*** 1½ in (4 cm) across, white, with five petals and yellow anthers, opening from woolly buds, borne in clusters at the ends of the shoots in summer. ***Fruit*** Small and hard, green or green flushed red, ¾ in (2 cm) across.

- **NATIVE REGION** S.W. Asia, Greece.
- **HABITAT** Woods and thickets.



Height 50 ft (15 m)	Shape Narrowly conical	Leaf persistence Deciduous	Leaf type

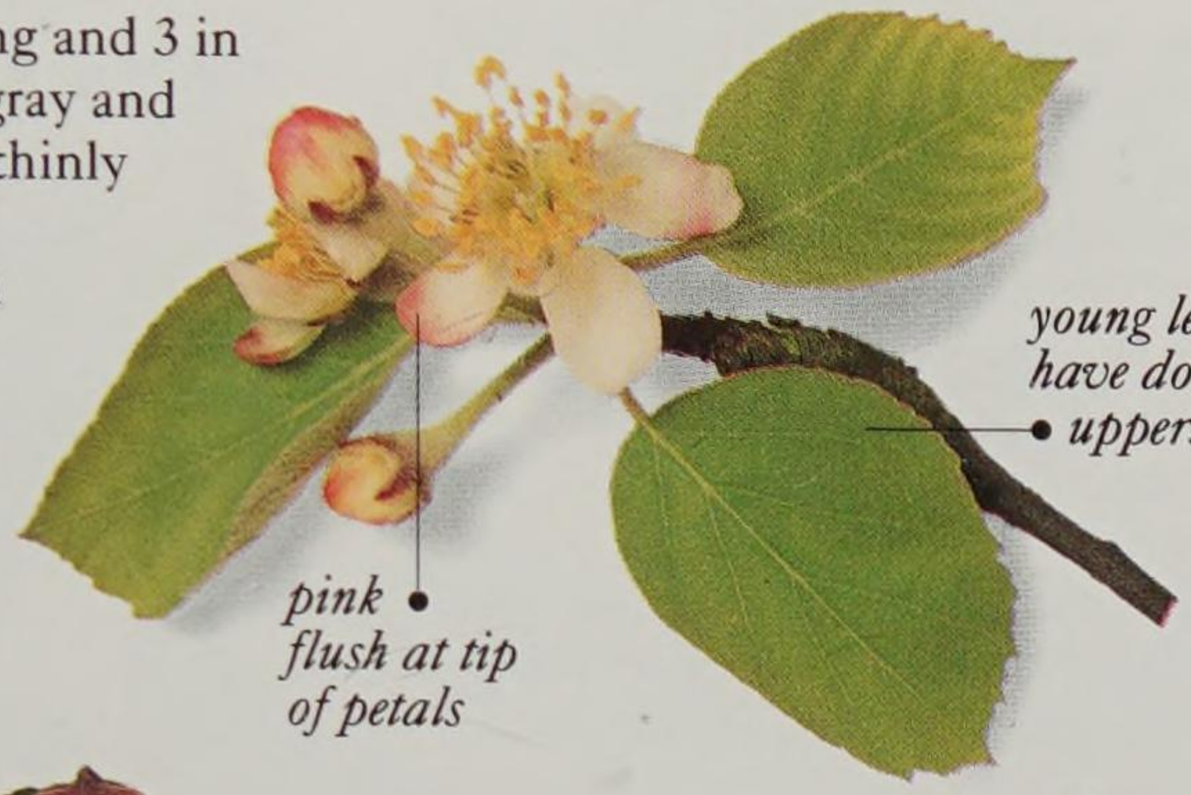
Family ROSACEAE	Species *Malus tschonoskii*	Author (Maximowicz) Schneider

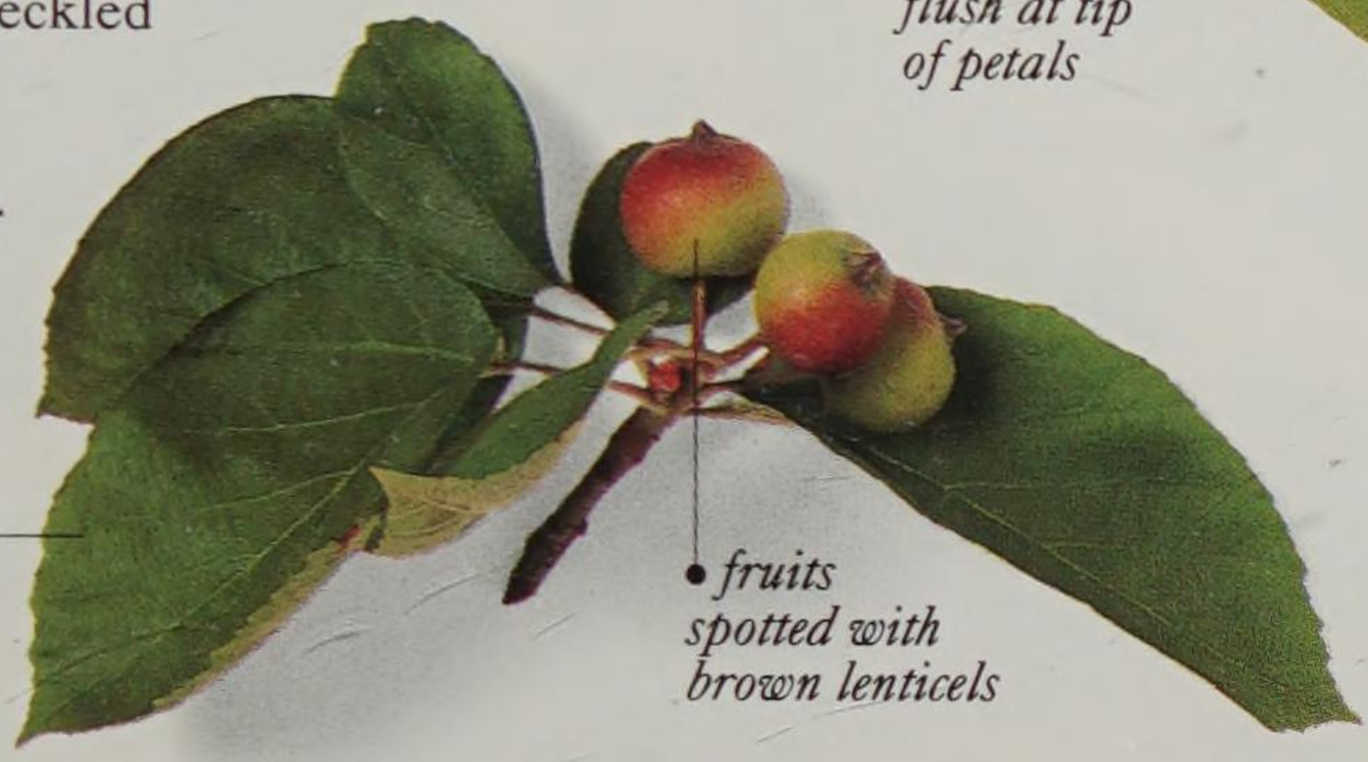
MALUS TSCHONOSKII

Leaves Broadly ovate, to 4¾ in (12 cm) long and 3 in (7.5 cm) across, pointed, sharply toothed, gray and hairy becoming smooth and glossy above, thinly hairy beneath. ***Bark*** Purple-brown and smooth, becoming fissured and rough with age. ***Flowers*** 1¼ in (3 cm) across, white flushed pink, with five petals and yellow anthers, in clusters of up to five in late spring. ***Fruit*** Rounded, yellow-green flushed red, to 1¼ in (3 cm) across, speckled with lenticels.

• **NATIVE REGION** Japan.

• **HABITAT** Shallow, rocky soil in woods.





Height 50 ft (15 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Malus yunnanensis*	Author (Franchet) Schneider

MALUS YUNNANENSIS

Leaves Broadly ovate, to 4 in (10 cm) long and 3½ in (9 cm) across, heart-shaped at the base, pointed at the tip, shallowly lobed, finely toothed, matte pale green above, softly hairy beneath, turning orange to red and purple in autumn. ***Bark*** Dark gray-brown, peeling in small flakes; orange-brown when freshly exposed. ***Flowers*** Individually ½ in (1.2 cm) across, white, with five petals, borne in flattened heads in late spring. ***Fruit*** Rounded, hard, deep red, ⅝ in (1.5 cm) across, freely speckled with pale brown lenticels, borne in dense clusters.

• **NATIVE REGION** S.W. China.

• **HABITAT** Woods and thickets on mountain slopes.

• **REMARK** The form shown, var. *veitchii*, differs in its brighter fruits, and in its leaves, which are heart shaped.

VAR. VEITCHII

Height 33 ft (10 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Malus* hybrids	Author None

CRAB APPLE HYBRIDS

Many of the garden crab apples are hybrids between various species, raised in cultivation and grown for the beauty of their flowers or fruits; the attraction of some of these trees lies in both flowers and the fruits that follow in autumn. The plants usually make small, spreading trees, reaching about 20–26 ft (6-8 m) in height, and flowering in late spring and early summer. Several species have purplish leaves and flowers. This coloration arises as a result of hybridization with *Malus niedzwetzkyana*, a species found originally in the central Asian region of Turkestan.

pinkish flower buds

◁ 'BUTTERBALL'
This hybrid was raised in the United States. Rounded, yellowish fruits succeed the pink-flushed, white flowers.

▽ 'BUTTERBALL'

fruits persist through autumn and winter

fruits mature to orange-yellow

▽ 'DARTMOUTH'
The small, white flowers of this form open from buds tinged faintly pink. The large fruits are 2 in (5 cm) across, red-purple and bloomy.

white flowers borne profusely

◁ 'CRITTENDEN'
This plant bears white flowers flushed slightly pink. They are followed by a profusion of bright scarlet fruits.

▽ 'CRITTENDEN'

fruits ripen from yellow to shades of purple and deep red

clustered flowers open after leaves unfold

bronze-purple young leaves

reddish purple flower petals narrow to white base

◁ 'ELEYI'
The fruits of this ornamental form are small, conical, and colored purple.

Height 26 ft (8 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

∇ 'JOHN DOWNIE'
The soft pink buds of this form open into small white flowers with yellow anthers. The egg-shaped fruits are 1¼ in (3 cm) long and orange-yellow flushed red.

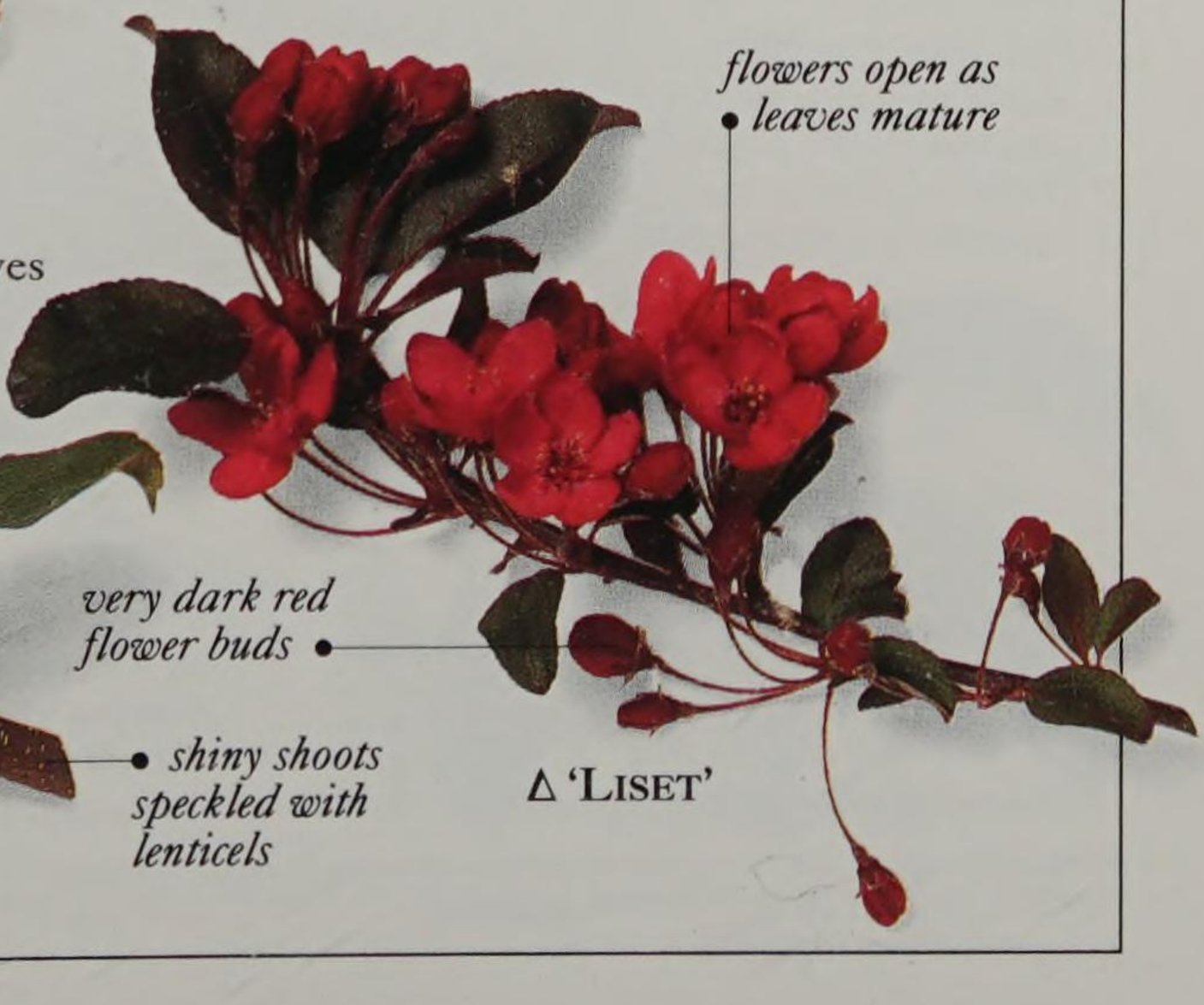
∆ 'JOHN DOWNIE'

∆ 'GOLDEN HORNET'
The flowers of this form are 1½ in (4 cm) across, pink in bud opening white flushed pink. The rounded, deep yellow fruits measure 1 in (2.5 cm) across.

'GOLDEN HORNET' ▷

◁ 'LEMOINEI'
This colorful hybrid has deep bronze-purple young leaves, which mature to purplish green. The purplish red flowers are 1½ in (4 cm) across, and the deep purple fruits ⅝ in (1.5 cm) long.

∇ 'LISET'
The bronze-purple young leaves of this form become dark green, contrasting with the deep purple-pink flowers.



∆ 'LISET'

Family ROSACEAE	Species *Malus* hybrids	Author None

small fruits carried on slender stalks

◁ **'PROFUSION'**
The purplish red flowers of this plant are 1½ in (4 cm) across, borne profusely in large clusters. The dark green, red-veined leaves are bronze-purple when young. Deep reddish purple, rounded fruits, ½ in (1.2 cm) across, are produced in autumn.

leaves are often lobed on strong shoots

fruits are red when ripe

'RED SENTINEL' ▷
The pink buds of this hybrid open into white flowers 1¼ in (3 cm) across, which set rounded, long-persistent, glossy deep red fruits, 1 in (2.5 cm) across.

petals flushed pink at base

Δ **'RED JADE'**
This mushroom-shaped tree bears clusters of pink buds, which open to white flowers. The bright red fruits are carried on the branches into late autumn.

Δ **'RED JADE'**

∇ **'ROYALTY'**
The glossy red-purple leaves of this compact tree turn red in late autumn. Deep red flower buds open deep red-purple.

'ROYALTY' ▷

double flowers have 15 petals each

leaves still reddish as fruits ripen

'VAN ESELTINE' ▷
This form is distinguished by its upright habit, double flowers, and the small, yellow or yellow flushed red fruits that follow in autumn.

Height To 26 ft (8 m)	Shape Variable	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Mespilus germanica*	Author Linnaeus

MEDLAR

Leaves Elliptic to oblong, to 6 in (15 cm) long and 2 in (5 cm) across, untoothed or finely toothed, dark green above, usually hairy on both sides, turning yellow and brown in autumn, on very short stalks; shoots often thorny. ***Bark*** Gray-brown and smooth at first, cracking into thin plates with age; orange-brown when freshly exposed. ***Flowers*** To 2 in (5 cm) across, white, with five petals, borne singly on short stalks in late spring to early summer; vigorous plants often flower again in late summer. ***Fruit*** Rounded, flat-topped to pear-shaped, fleshy, brown, to 1¼ in (3 cm) across, with persistent sepals at the top.

• **NATIVE REGION**
S.W. Asia, S.E. Europe.

• **HABITAT** Forests, wood margins, and mountain thickets.

• **REMARK** Wild plants tend to be more shrubby than cultivated forms. The fruit becomes edible only after exposure to frost.

MESPILUS GERMANICA ▷

finely toothed leaf margin

untoothed leaf margin

white flowers borne singly

sepals remain attached to fruits

'NOTTINGHAM' ▷

▽ **'NOTTINGHAM'**
This cultivated form is selected for its large fruits.

cultivated form has larger leaves

green sepals appear between petals

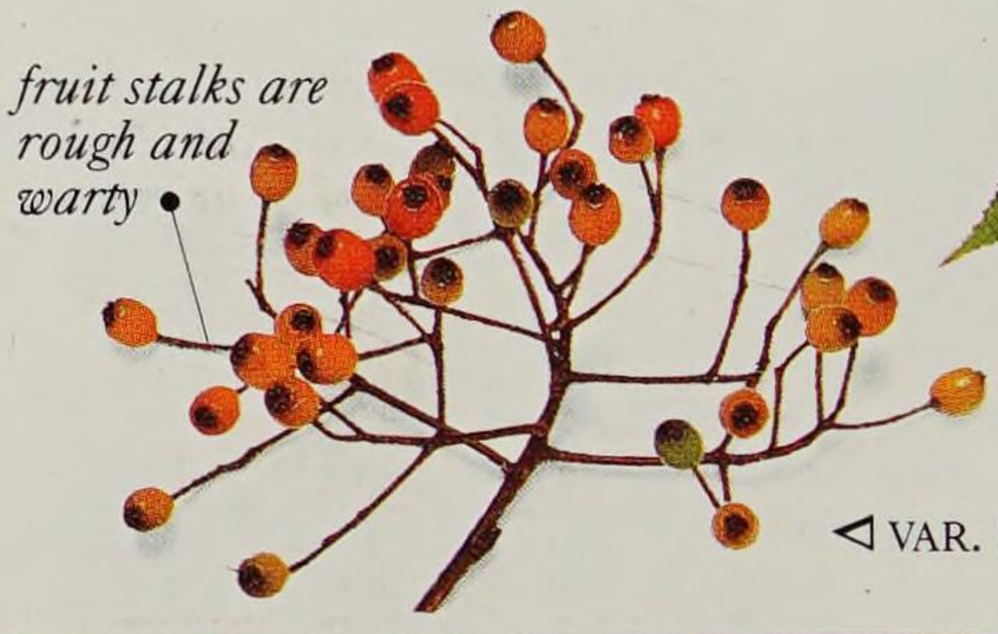
Height 20 ft (6 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Photinia beauverdiana*	Author Schneider

PHOTINIA BEAUVERDIANA

Leaves Elliptic to lanceolate, or obovate, to 4¾ in (12 cm) long and 2 in (5 cm) across, narrowed at the base, taper-pointed at the tip, sharply toothed, dark green above, smooth on both sides, turning red in autumn. ***Bark*** Gray and smooth, fluted at the base of the trunk. ***Flowers*** Individually ⅜ in (1 cm) across, white, with five petals, in flattened heads to 2 in (5 cm) across, in late spring. ***Fruit*** Egg-shaped, ³⁄₁₆ in (5 mm) across, green ripening to red.

- **NATIVE REGION** W. China.
- **HABITAT** Woods and thickets.



◁ VAR. NOTABILIS

Height 20 ft (6 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Photinia davidiana*	Author (Decaisne) Cardot

PHOTINIA DAVIDIANA

Leaves Elliptic to oblong or oblanceolate, to 4¾ in (12 cm) long and 1½ in (4 cm) across, taper-pointed at the tip, untoothed, dark green above, nearly smooth on both sides, turning red before falling. ***Bark*** Gray-brown and smooth. ***Flowers*** Individually ¼ in (6 mm) across, white, with five petals and pink anthers, in dense, rounded heads about 3 in (7.5 cm) across, in midsummer. ***Fruit*** Rounded and bright red, about ⁵⁄₁₆ in (8 mm) across, on long stalks, in small clusters.

- **NATIVE REGION** China, Vietnam.
- **HABITAT** Woods, thickets, and cliffs.

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

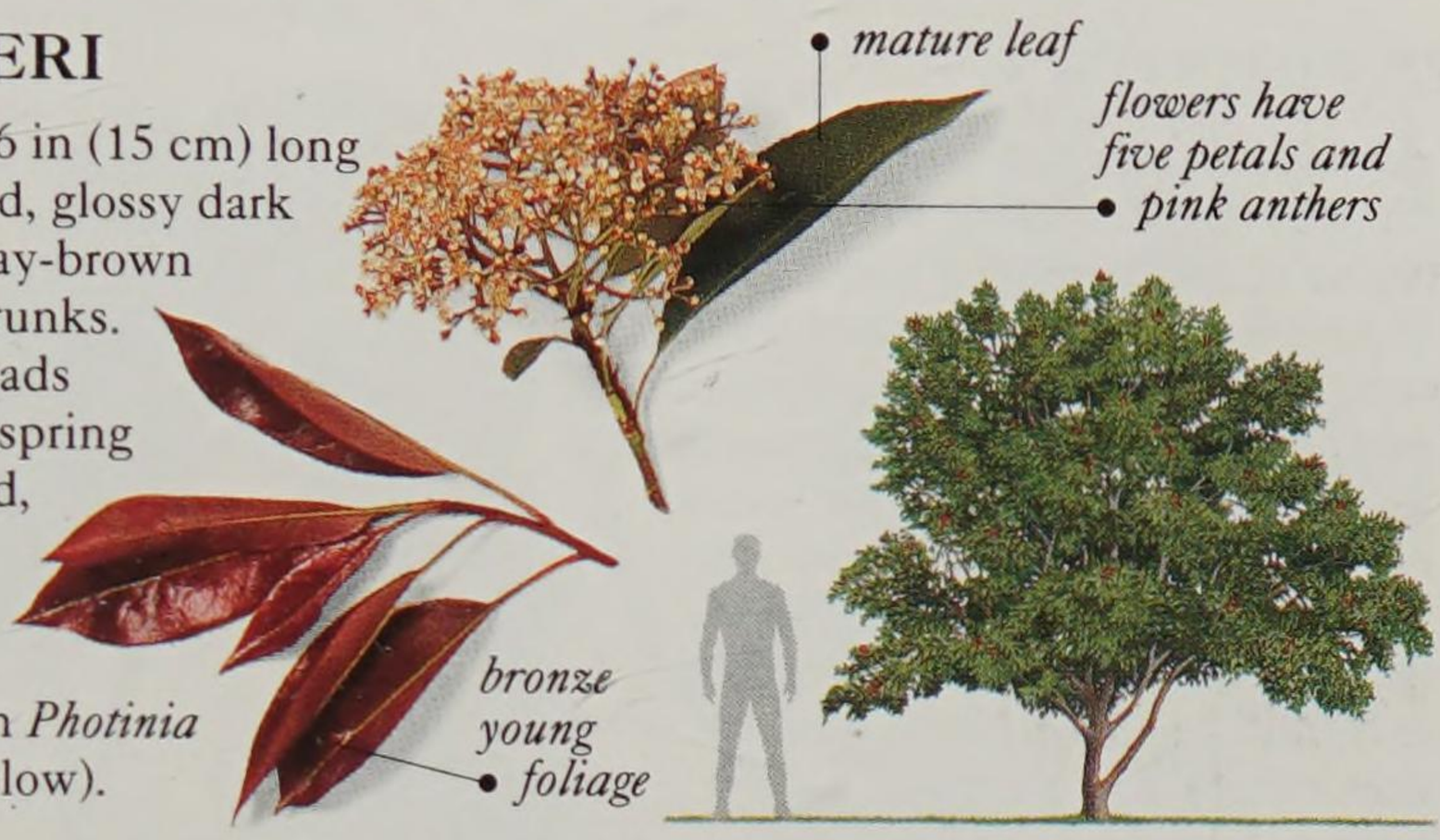
Family ROSACEAE	Species *Photinia x fraseri*	Author Dress

PHOTINIA X FRASERI

Leaves Oblong to obovate, to 6 in (15 cm) long and 2½ in (6 cm) across, toothed, glossy dark green above, smooth. ***Bark*** Gray-brown and smooth, peeling on large trunks. ***Flowers*** White, in flattened heads 4¾ in (12 cm) across, from late spring to summer. ***Fruit*** Rounded, red, 3/16 in (5 mm) across.

• **NATIVE REGION**
Of garden origin.

• **REMARK** A hybrid between *Photinia glabra* and *P. serratifolia* (see below).



Height 20 ft (6 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

Family ROSACEAE	Species *Photinia serratifolia*	Author (Desfontaines) Kalkman

PHOTINIA SERRATIFOLIA

Leaves Oblong to lanceolate, to 8 in (20 cm) long and 3 in (7.5 cm) across, toothed, glossy dark green above, smooth, on stout, smooth, red shoots. ***Bark*** Gray-brown, smooth, peeling in flakes. ***Flowers*** ⅜ in (1 cm) across, white, in large, flattened heads to 6 in (15 cm) across, at the ends of the shoots in mid- to late spring. ***Fruit*** Rounded, red, ¼ in (6 mm) across, persisting over winter.

• **NATIVE REGION** China.

• **HABITAT** Thickets.

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

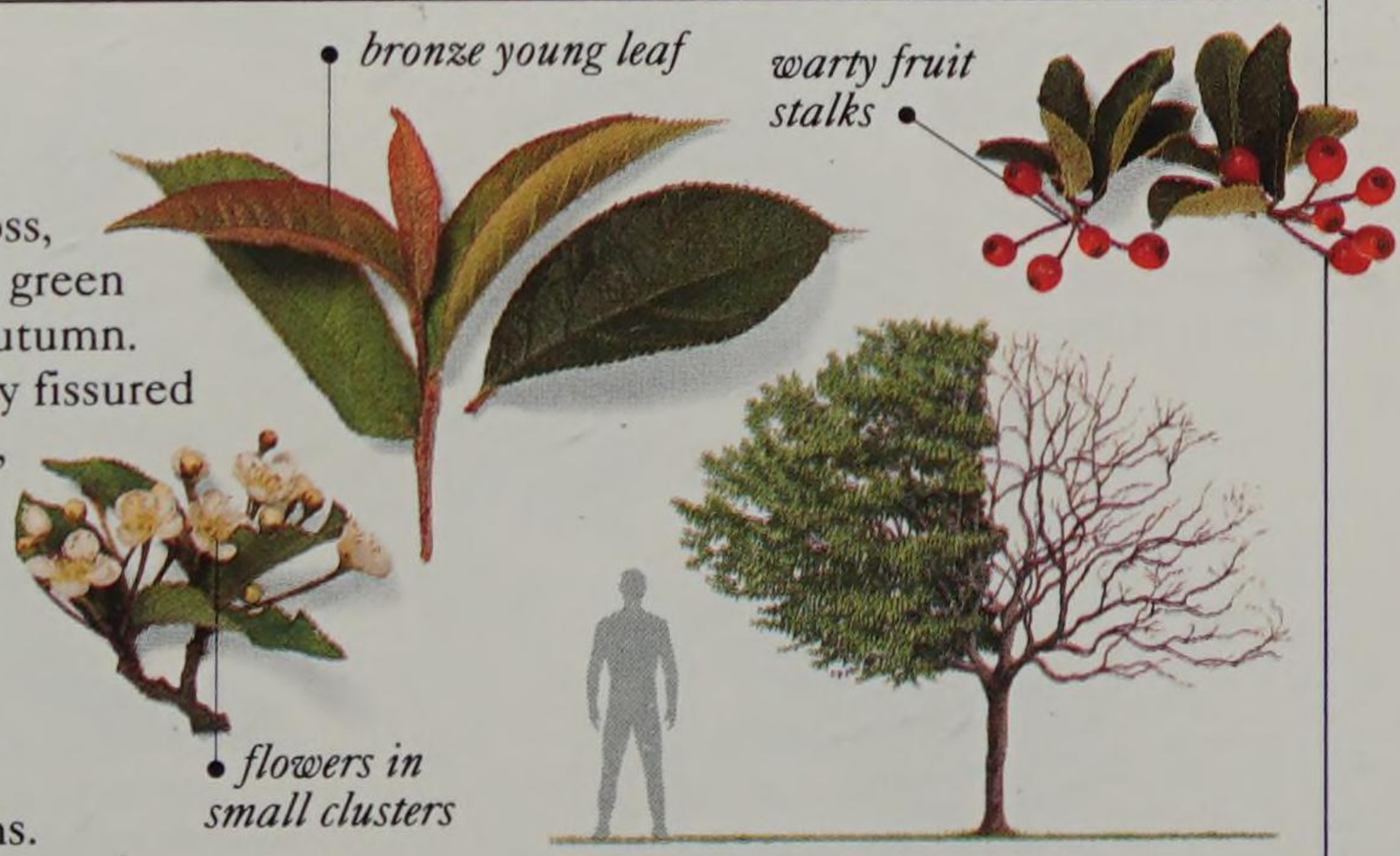
Family ROSACEAE	Species *Photinia villosa*	Author (Thunberg) Candolle

PHOTINIA VILLOSA

Leaves Elliptic to obovate, to 3 in (7.5 cm) long and 1½ in (4 cm) across, taper-pointed, finely toothed, dark green above, turning red and orange in autumn. ***Bark*** Gray to gray-brown, shallowly fissured with age. ***Flowers*** Small and white, with five petals and pink anthers, in small, flattened clusters in late spring. ***Fruit*** Egg-shaped, edible, red, about ⅜ in (1 cm) long.

• **NATIVE REGION**
China, Japan, Korea.

• **HABITAT** Woods and by streams.



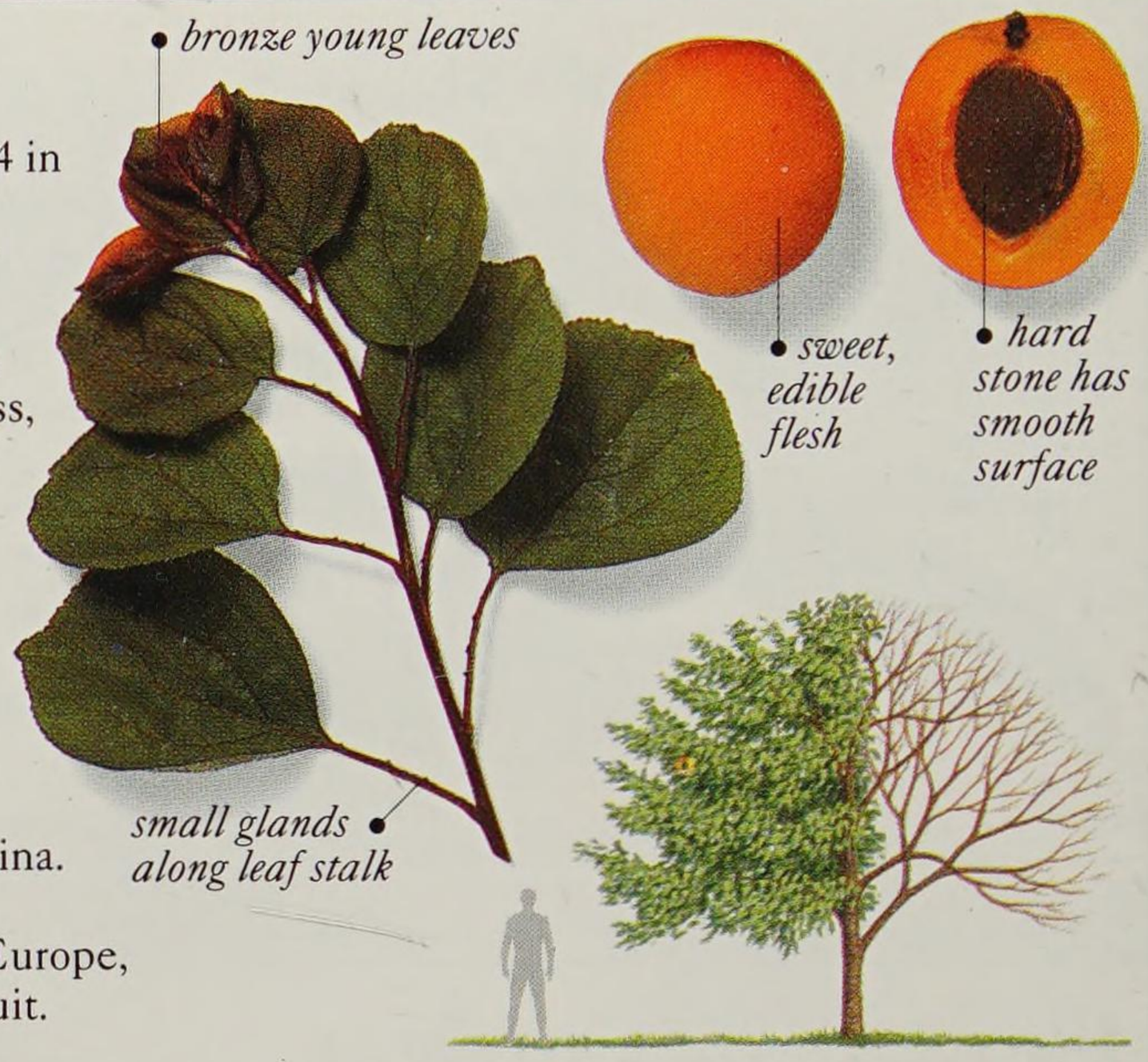
Height 17 ft (5 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Prunus armeniaca*	Author Linnaeus

APRICOT

Leaves Broadly ovate to rounded, to 4 in (10 cm) long and 2½ in (6 cm) across, with a usually rounded base, abruptly taper-pointed, finely toothed, glossy dark green. ***Bark*** Red-brown, smooth and glossy. ***Flowers*** 1 in (2.5 cm) across, pale pink or white, with five petals, nearly stalkless, usually borne singly on old shoots in early spring before the leaves emerge. ***Fruit*** Rounded and fleshy, edible, yellow sometimes flushed red, with a single hard, smooth stone enclosing an edible, white seed.

- **NATIVE REGION** C. Asia, N. China.
- **HABITAT** Hillsides and thickets.
- **REMARK** Naturalized in parts of Europe, and widely cultivated for its edible fruit.



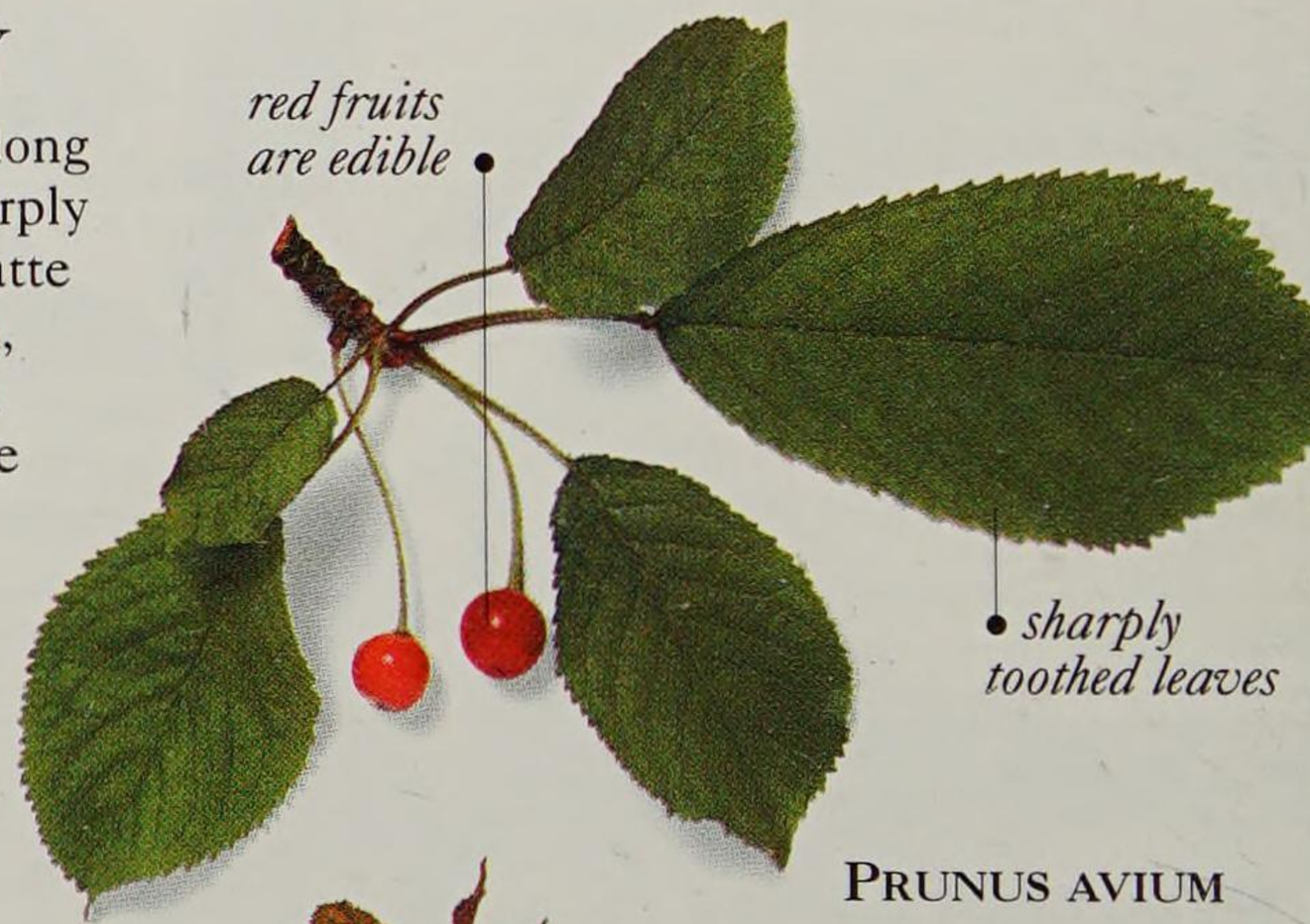
Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Prunus avium*	Author Linnaeus

SWEET OR BIRD CHERRY

Leaves Elliptic to oblong, to 6 in (15 cm) long and 2½ in (6 cm) across, taper-pointed, sharply toothed, bronze when young becoming matte deep green above. ***Bark*** Glossy red-brown, peeling in horizontal bands. ***Flowers*** 1¼ in (3 cm) across, white, with five petals, borne in clusters in mid-spring just before or as the leaves emerge. ***Fruit*** A rounded, bitter or sweet, edible red berry, about ⅜ in (1 cm) across.

- **NATIVE REGION** Europe.
- **HABITAT** Woods and hedgerows.
- **REMARK** Also known as mazzard, gean, wild cherry. The species is most familiar in flower as a woodland tree. It may reach only 65 ft (20 m).



PRUNUS AVIUM

Δ 'PLENA'
The large, double flowers of this smaller cultivar have numerous petals.

Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

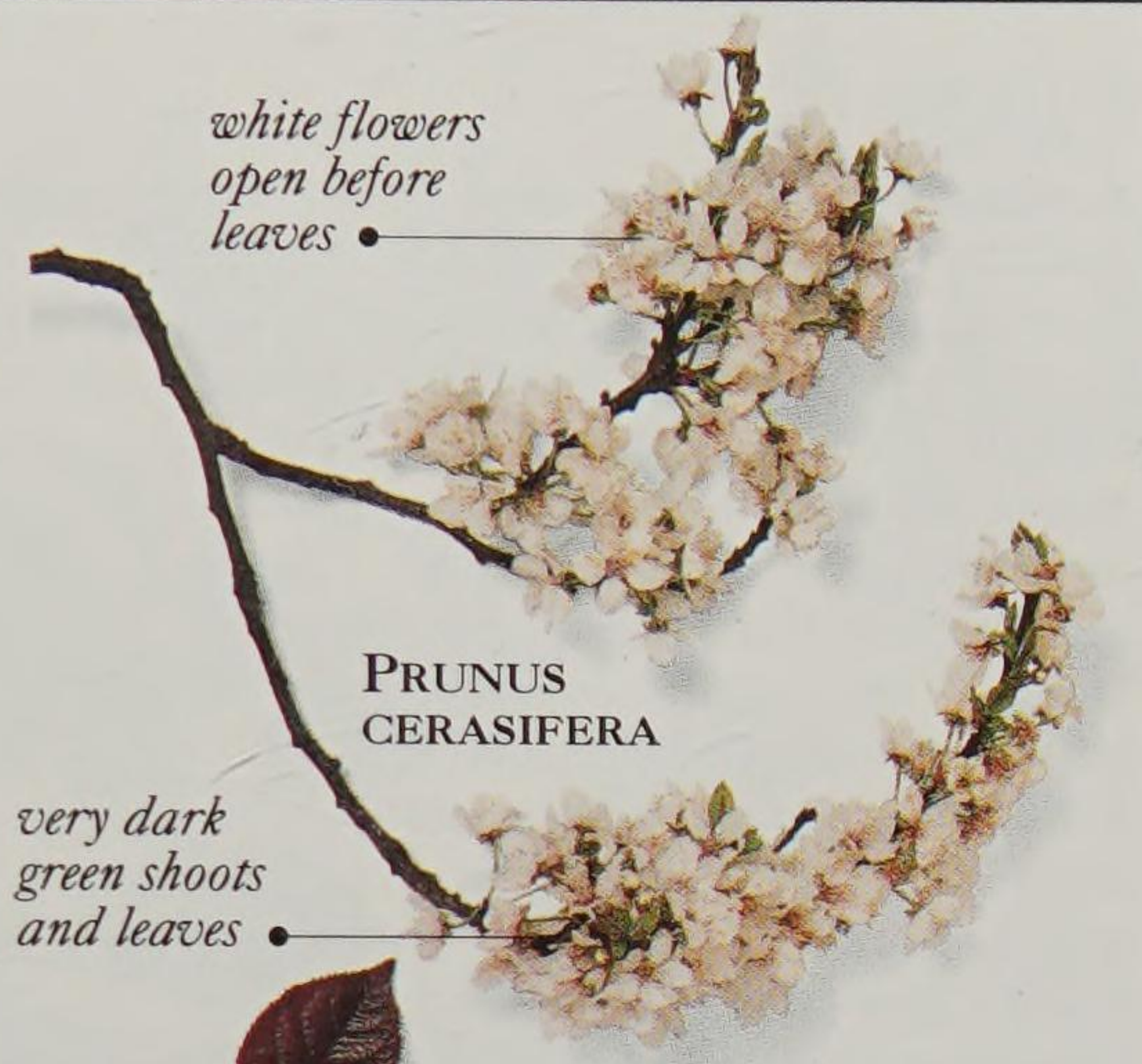
Family ROSACEAE	Species *Prunus cerasifera*	Author Ehrhart

CHERRY PLUM

Leaves Ovate to obovate, to 2½ in (6 cm) long and 1¼ in (6 cm) across, toothed at the margin, glossy dark green and smooth above, downy on the veins beneath. ***Bark*** Purple-brown, thinly scaly, with horizontal, orange lenticels, fissured with age. ***Flowers*** 1 in (2.5 cm) across, white, with five petals and reflexed sepals, borne singly or in small clusters in early spring before the leaves emerge. ***Fruit*** Rounded, plumlike, edible and red, 1¼ in (3 cm) across.

• **NATIVE REGION** Of garden origin.

• **REMARK** Also known as myrobalan. A similar species is the yellow-fruiting *Prunus divaricata*, which is native to S.E. Europe, and C. and S.W. Asia.



◁ **'NIGRA'**
Deep red-purple leaves and pink flowers distinguish this form.

Δ 'PISSARDII'
This form has pink flower buds, opening to white, and purple leaves.

Δ 'ROSEA'
This hybrid has red-purple foliage and small, pink flowers.

Height 26 ft (8 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Prunus cerasus*	Author Linnaeus

SOUR CHERRY

Leaves Elliptic to ovate, to 3 in (7.5 cm) long and 2 in (5 cm) across, taper-pointed, sharply toothed, dark green above, smooth on both sides. ***Bark*** Purple-brown, with horizontal, orange-brown lenticels, peeling horizontally. ***Flowers*** ¾ in (2 cm) across, white, with five petals, in small clusters in mid-spring. ***Fruit*** An edible, red to black cherry, ¾ in (2 cm) across.

• **NATIVE REGION** Of garden origin.

• **REMARK** This species is related to sweet cherry *(Prunus avium*, see p.258).

Δ 'RHEXII'
This form has large, rosettelike flowers.

Height 26 ft (8 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

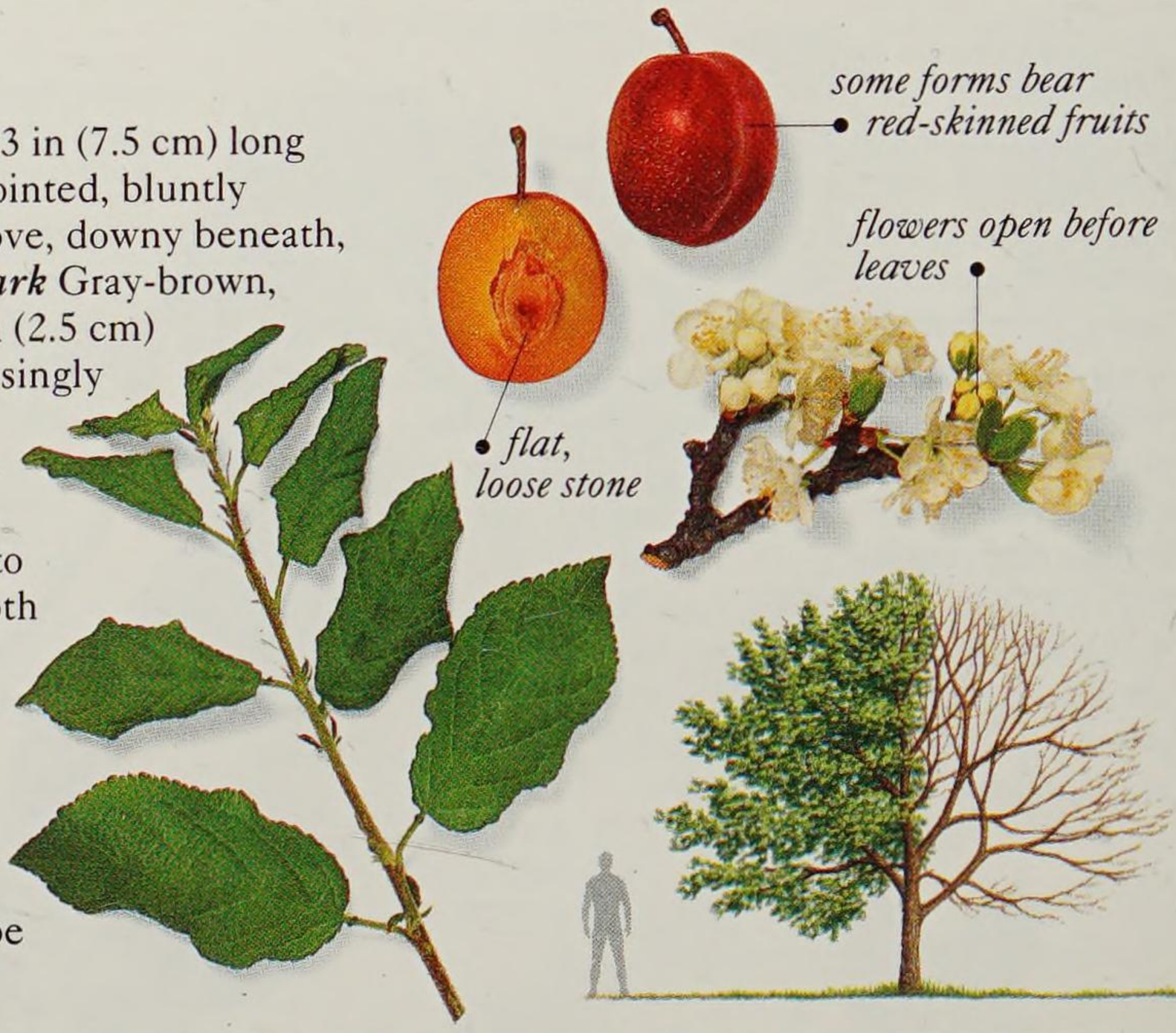
Family ROSACEAE	Species *Prunus domestica*	Author Linnaeus

PLUM

Leaves Elliptic to obovate, to 3 in (7.5 cm) long and 2 in (5 cm) across, short-pointed, bluntly toothed, matte deep green above, downy beneath, on usually spineless shoots. ***Bark*** Gray-brown, fissured with age. ***Flowers*** 1 in (2.5 cm) across, white, with five petals, singly or in clusters of up to three in spring. ***Fruit*** Rounded to egg-shaped, fleshy, sharp to sweet, edible, yellow, red, or purple, to 3 in (7.5 cm) long, with a smooth skin, enclosing a single stone with a white seed.

• **NATIVE REGION**
Of garden origin.

• **REMARK** Probably a hybrid between cherry plum *(P. cerasifera*, see p.259) and sloe *(P. spinosa)*, now naturalized.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Prunus dulcis*	Author (Miller) Webb

ALMOND

Leaves Lanceolate to narrowly elliptic, to 4¾ in (12 cm) long and 1½ in (4 cm) across, with a long, tapering point, finely toothed, dark green. ***Bark*** Dark gray, cracking into small plates with age. ***Flowers*** To 2 in (5 cm) across, pink fading to white or completely white, with five petals, borne singly or in pairs in early spring before the young leaves. ***Fruit*** Green and velvety, to 2½ in (6 cm) long, the flesh dry and leathery, enclosing a single stone with an edible, white seed.

• **NATIVE REGION**
N. Africa, C. and S.W. Asia.

• **HABITAT** Dry slopes, scrub, and woods.

◁ **'ROSEOPLENA'**
The pink double flowers of this form open at the same time as the leaves unfold.

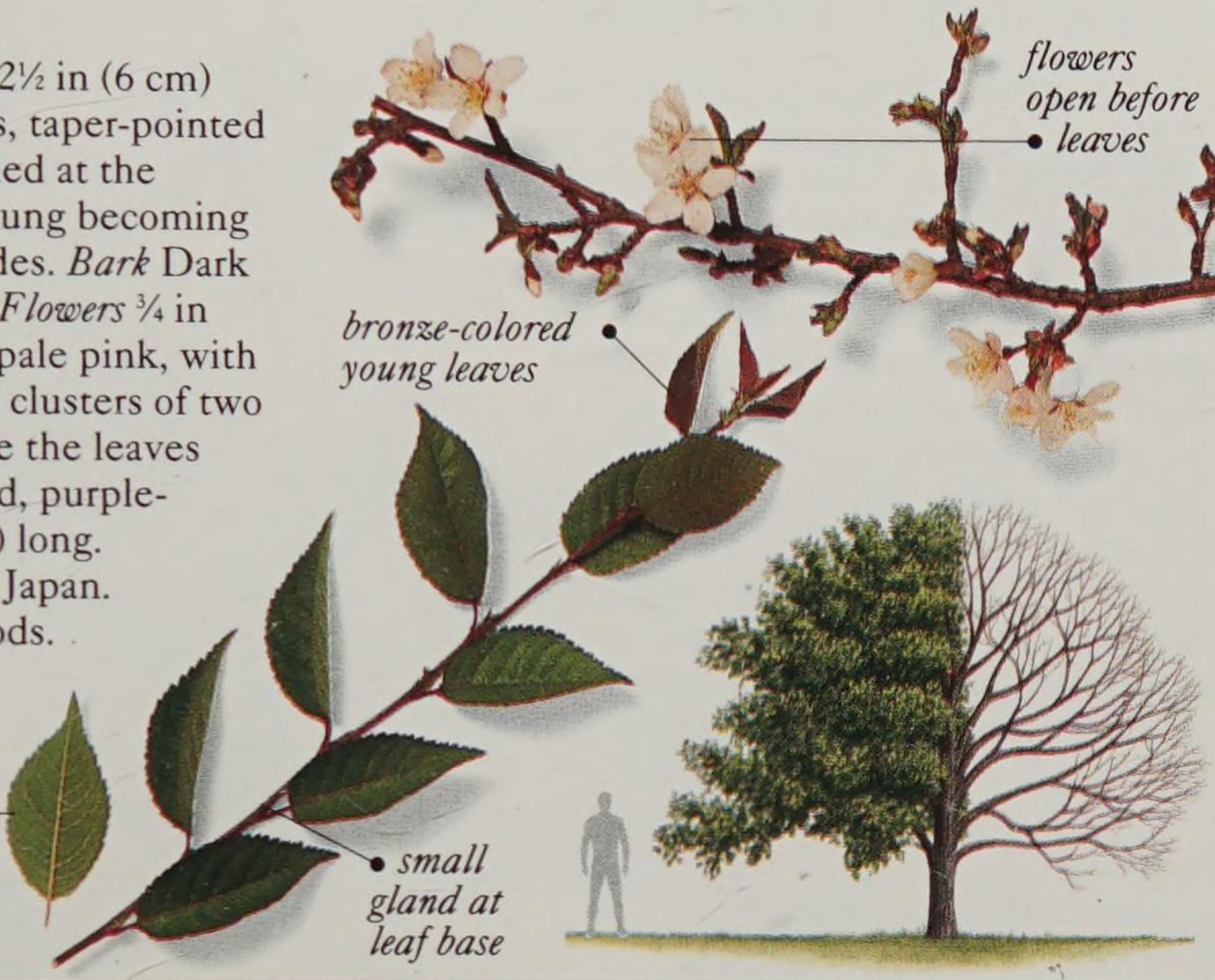
Height 26 ft (8 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Prunus incisa*	Author Thunberg

FUJI CHERRY

Leaves Ovate to obovate, to 2½ in (6 cm) long and 1¼ in (3 cm) across, taper-pointed at the tip, very sharply toothed at the margin, bronze-red when young becoming dark green, hairy on both sides. *Bark* Dark gray and vertically fissured. *Flowers* ¾ in (2 cm) across, white or very pale pink, with five notched petals, in small clusters of two or three in mid-spring before the leaves emerge. *Fruit* An egg-shaped, purple-black cherry, to 5/16 in (8 mm) long.

• **NATIVE REGION** S.W. Japan.
• **HABITAT** Mountain woods.



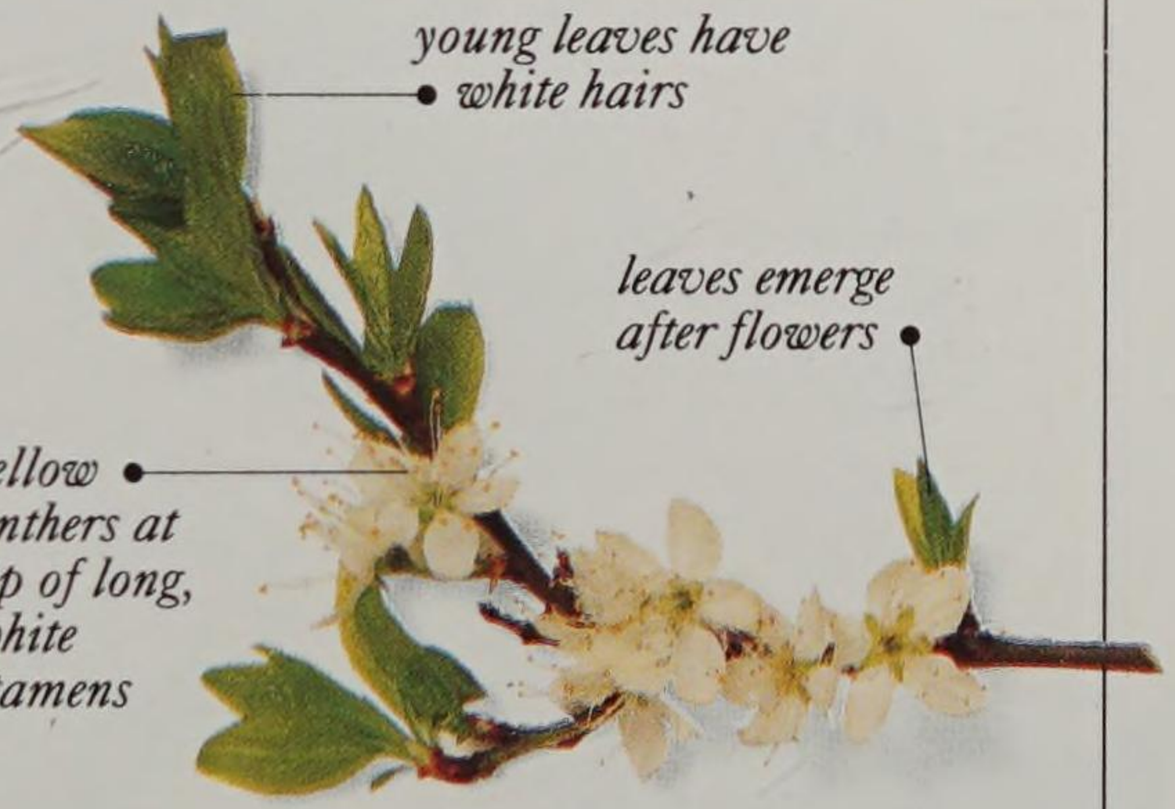
Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Prunus insititia*	Author Linnaeus

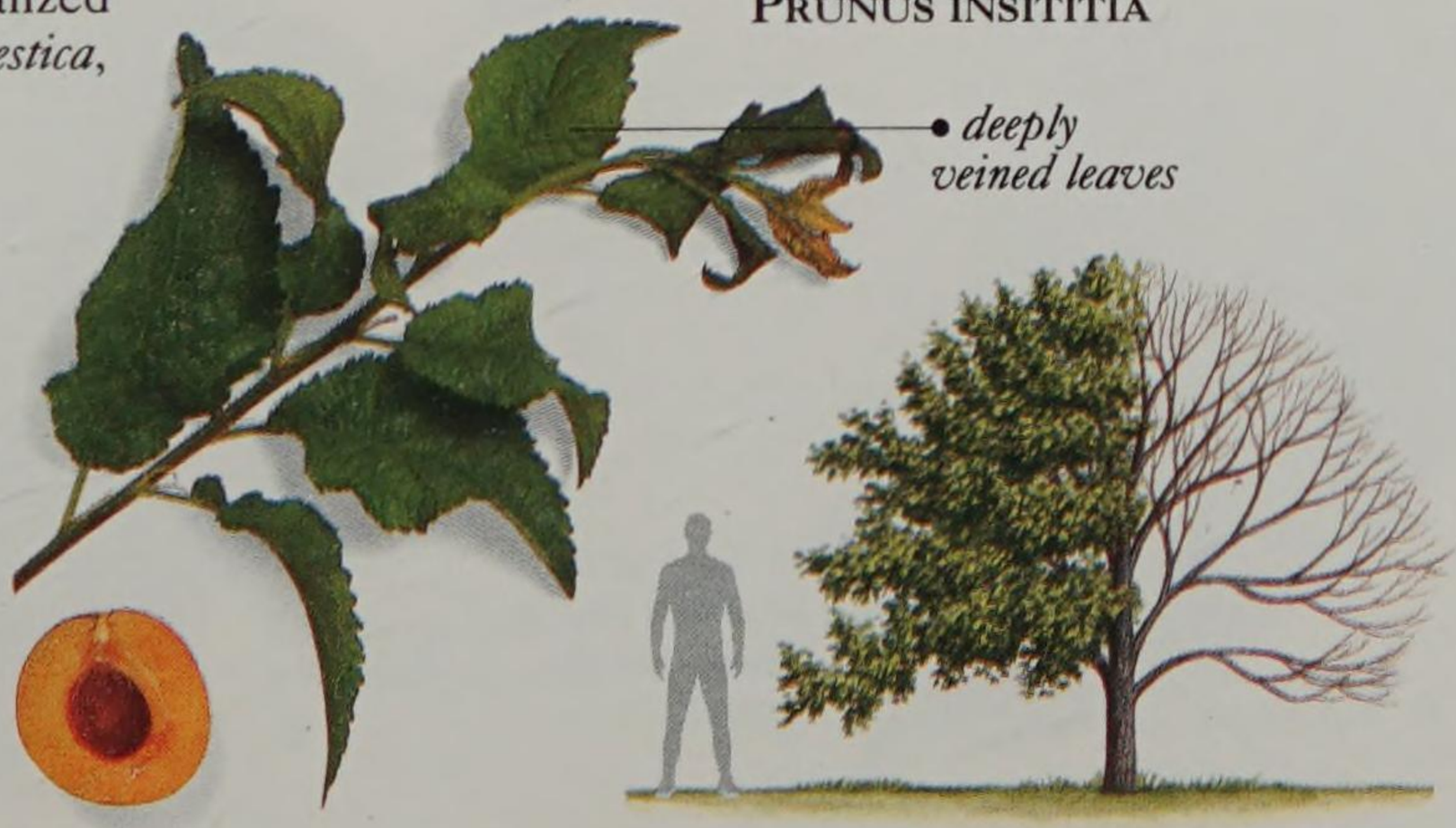
BULLACE OR DAMSON

Leaves Elliptic to obovate, to 3 in (7.5 cm) long and 2 in (5 cm) across, abruptly short-pointed at the tip, bluntly toothed, matte deep green above, on often spiny shoots. ***Bark*** Dark gray, smooth, usually fissured with age. ***Flowers*** 1 in (2.5 cm) across, white, with five petals, borne singly or in small clusters of up to three in spring before the leaves emerge. ***Fruit*** Rounded to egg-shaped, fleshy, edible purple, to 2 in (5 cm) long, the nearly rounded stone clinging to the flesh.

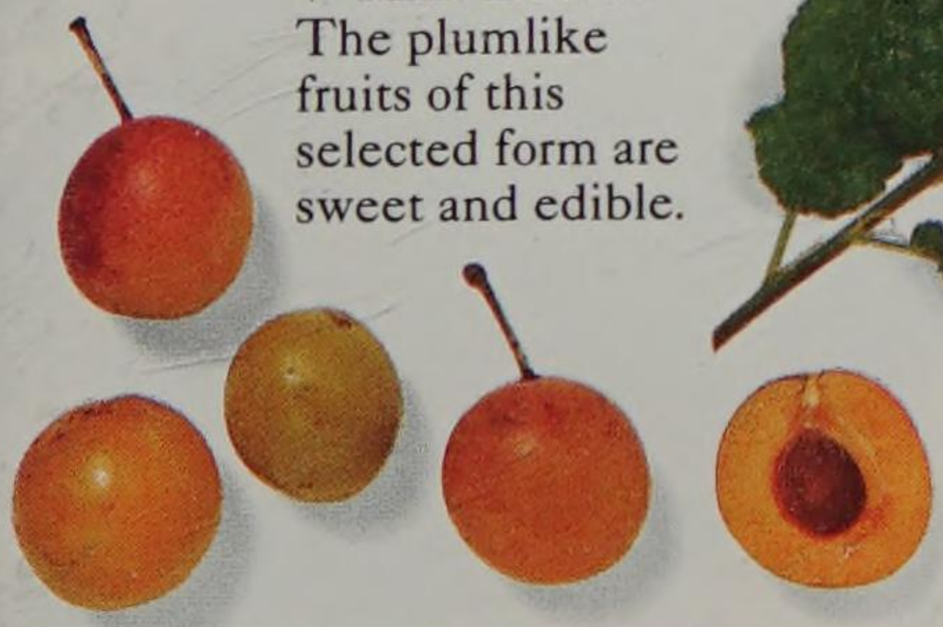
• **NATIVE REGION** Of garden origin.
• **REMARK** A widely naturalized relative of plum *(Prunus domestica*, see p.260). Its varieties include greengage.



PRUNUS INSITITIA



▽ **'MIRABELLE'** The plumlike fruits of this selected form are sweet and edible.



Height 23 ft (7 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Prunus* forms or hybrids	Author None

JAPANESE CHERRIES

The Japanese cherries, or *Sato-zakura*, are ornamental, flowering garden trees raised or selected in Japan. They are thought to be forms or hybrids of two native Japanese species, the hill cherry *(Prunus jamasakura*, see p.265) and the Oshima cherry *(Prunus speciosa)*: trees similar to some of them grow wild in the hills and mountains of Japan. They have been cultivated in Japanese gardens for more than 1,500 years, yet are of relatively recent introduction to the West. Most have a spreading habit, but some are weeping or narrowly upright. The showy flowers are single to semidouble or fully double, and range from white to deep pink.

∇ 'AMANOGAWA'
A distinct tree of narrow, upright habit, to about 26 ft (8 m) in height. The pale pink double flowers are 1½ in (4 cm) across, and open in mid-spring before or with the young leaves.

'KANZAN' OR 'SEK YOMA' Δ
This most popular and commonly planted Japanese cherry tree is vase shaped at first. Its branches spread and arch as the plant ages, to reach 33 ft (10 m) or more in height.

Δ 'KANZAN'

Δ 'CHEAL'S WEEPING' OR 'KIKU SHIDARE'
This form, which has long branches arching to the ground, usually reaches about 8 ft (2.5 m).

Height To 33 ft (10 m)	Shape Variable	Leaf persistence Deciduous	Leaf type

◁ **'SHIROFUGEN'**
One of the most beautiful of Japanese cherries, this spreading tree grows to 33 ft (10 m) tall. The double flowers are pink in bud, and open white in late spring. They turn again to pink before they fall.

flowers fade to white after opening

flowers hang in clusters beneath shoots

sharply toothed petals

young leaves mature to dark green

large white flowers have pink stamens

△ **'SHOGETSU'**
The large, white double flowers of this spreading tree open from pink-tinged buds in late spring, and form drooping clusters among the pale green young leaves.

'TAI HAKU' ▷
The great white cherry was found in an English garden and reintroduced to Japan, where at one time it had been thought lost to cultivation. Its single flowers are the largest of those of any flowering cherry. They open in mid-spring among bronze-colored leaves.

petals tinged green

leaves edged with fine-pointed teeth

△ **'UKON'**
The distinctive double flowers of this form are pale yellow-green flushed at first with pink. They open in mid-spring with the bronze-tinged young leaves.

Family ROSACEAE	Species *Prunus* hybrids	Author None

PRUNUS HYBRIDS

Apart from the Japanese cherries, there are many other hybrids between various species, either intentionally or accidentally raised and grown for their ornamental flowers and foliage. Their parentage involves several different species and hybrids, including *P. sargentii* (see p.268) and *P.* x *subhirtella* (see pp.270–271), and so these trees are more diverse than the Japanese cherries. They can be upright or spreading, usually reach no more than 33 ft (10 m), and are always deciduous; some produce good autumn color. The flowers are single to semidouble or fully double, usually opening in early to late spring.

Δ 'ACCOLADE'
This small tree is thought to be a hybrid between *Prunus sargentii* (see p.268) and *Prunus* x *subhirtella* (see p.270).

Δ 'PANDORA'
This tree has pale pink single flowers, each with five petals. They open in early spring before the leaves emerge.

Δ 'SPIRE'
The matte dark green foliage of this form turns orange and red in autumn.

Height To 33 ft (10 m)	Shape Variable	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Prunus jamasakura*	Author Siebold ex Koidzumi

HILL CHERRY

Leaves Oblong to obovate, to 4¾ in (12 cm) long and 2 in (5 cm) across, abruptly taper-pointed at the tip, sharply toothed, bronze or red becoming deep green above, blue-green beneath, smooth on both sides, turning yellow to red in autumn. ***Bark*** Purple-brown, with horizontal lenticels. ***Flowers*** 1¼ in (3 cm) across, pale pink to nearly white, with five petals notched at the tip, opening in small clusters in mid-spring as the young leaves emerge. ***Fruit*** A fleshy, deep purple-black berry, 1 in (2.5 cm) long.

• **NATIVE REGION** China, Japan, Korea.

• **HABITAT** Woods in hills and low mountains.

• **REMARK** Also known as *Prunus serrulata* var. *spontanea*.

Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

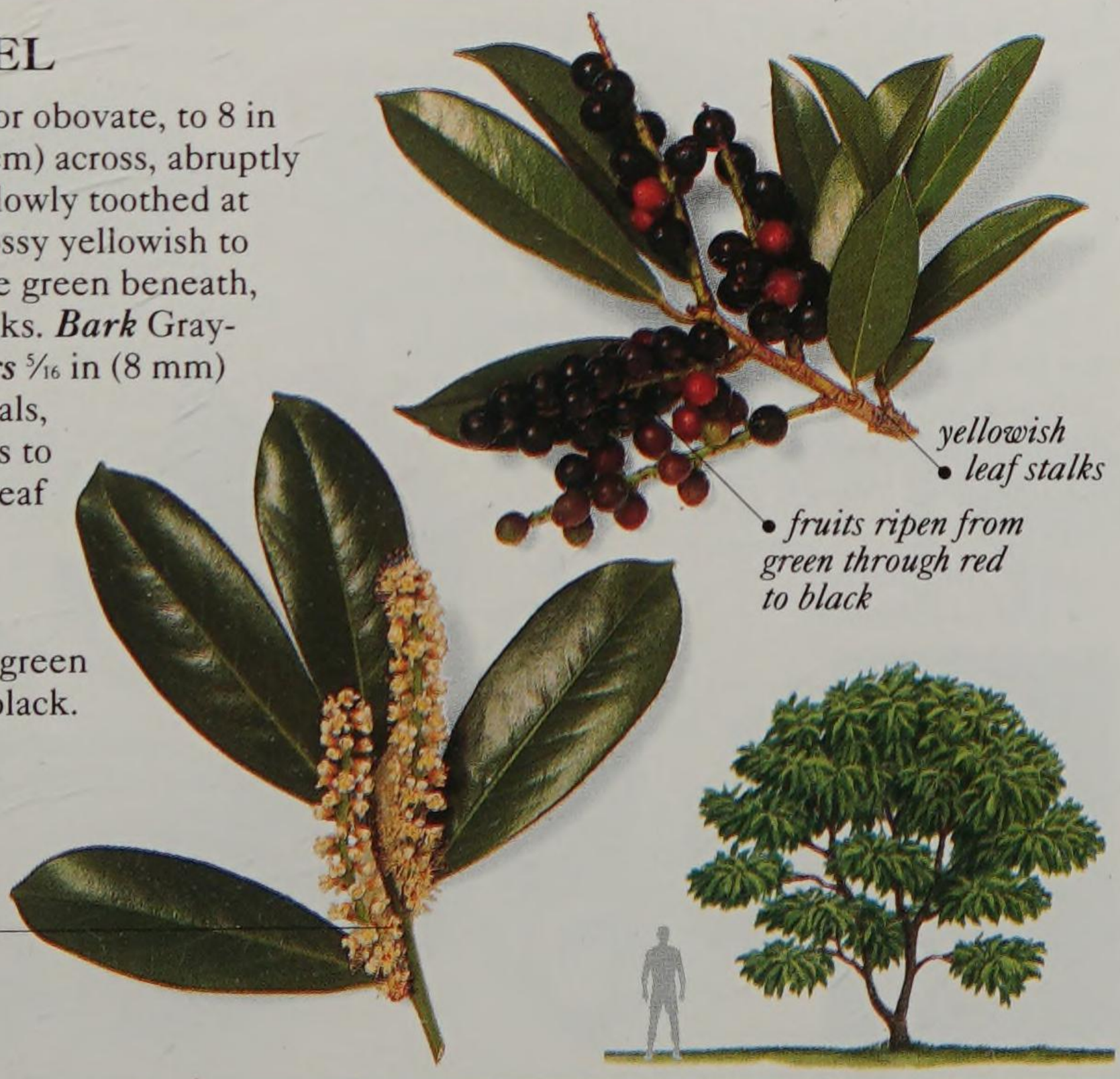
Family ROSACEAE	Species *Prunus laurocerasus*	Author Linnaeus

CHERRY LAUREL

Leaves Elliptic to oblong or obovate, to 8 in (20 cm) long and 2½ in (6 cm) across, abruptly short-pointed, usually shallowly toothed at least above the middle, glossy yellowish to very dark green above, pale green beneath, smooth, on short, stout stalks. ***Bark*** Gray-brown and smooth. ***Flowers*** 5/16 in (8 mm) across, white, with five petals, fragrant, in upright racemes to 4¾ in (12 cm) long, in the leaf axils in mid-spring, sometimes flowering again in autumn. ***Fruit*** A rounded berry, ½ in (1.2 cm) across, green becoming red ripening to black.

• **NATIVE REGION** S.W. Asia, E. Europe.

• **HABITAT** Thickets in forests.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

Family ROSACEAE	Species *Prunus lusitanica*	Author Linnaeus

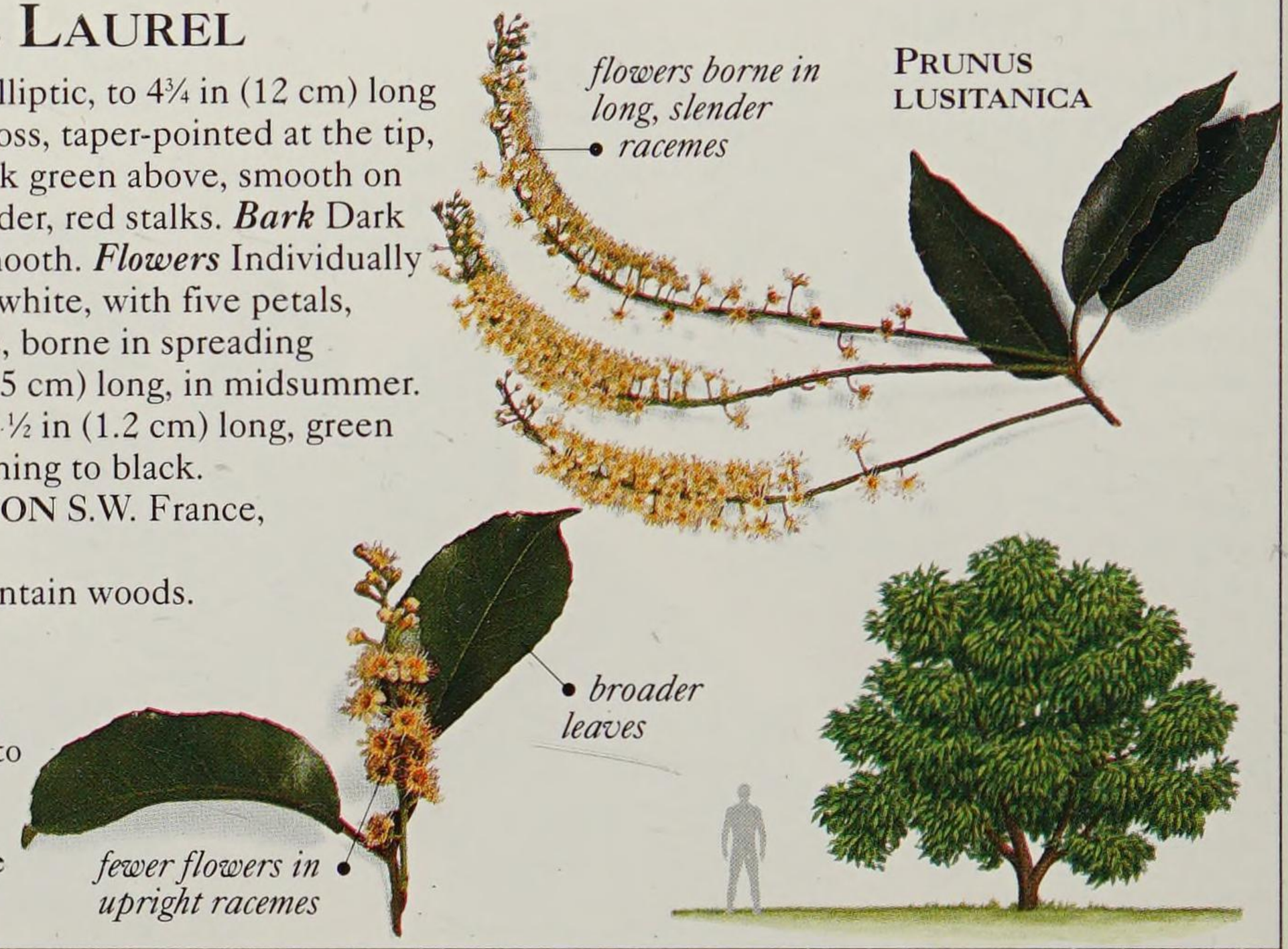
PORTUGAL LAUREL

Leaves Ovate to elliptic, to 4¾ in (12 cm) long and 2 in (5 cm) across, taper-pointed at the tip, toothed, glossy dark green above, smooth on both sides, on slender, red stalks. ***Bark*** Dark gray-brown and smooth. ***Flowers*** Individually ⅜ in (1 cm) across, white, with five petals, fragrant, numerous, borne in spreading racemes to 10 in (25 cm) long, in midsummer. ***Fruit*** Egg-shaped, ½ in (1.2 cm) long, green becoming red ripening to black.

• **NATIVE REGION** S.W. France, Portugal, Spain.

• **HABITAT** Mountain woods.

SUBSP. AZORICA ▷ This form is native to the North Atlantic islands, the Azores. Its flowers are borne in shorter racemes.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Evergreen	Leaf type

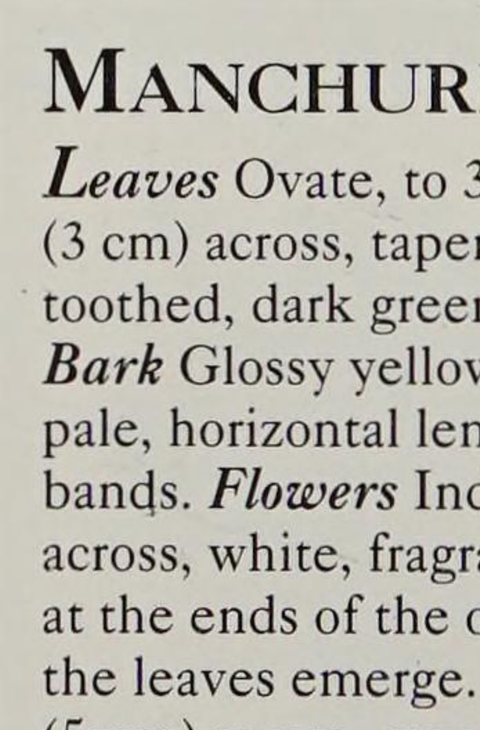
Family ROSACEAE	Species *Prunus maackii*	Author Ruprecht

MANCHURIAN CHERRY

Leaves Ovate, to 3 in (7.5 cm) long and 1¼ in (3 cm) across, taper-pointed at the tip, finely toothed, dark green, turning yellow in autumn. ***Bark*** Glossy yellow-brown and smooth, with pale, horizontal lenticels, peeling in horizontal bands. ***Flowers*** Individually about ⅜ in (1 cm) across, white, fragrant, borne in dense racemes at the ends of the old shoots in mid-spring as the leaves emerge. ***Fruit*** Rounded, 3⁄16 in (5mm) across, green ripening to black.

• **NATIVE REGION** N.E. Asia.

• **HABITAT** Woods.



Height 40 ft (12 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Prunus padus*	Author Linnaeus

BIRD CHERRY

Leaves Elliptic, to 4 in (10 cm) long and 2½ in (6 cm) across, taper-pointed, finely toothed, matte dark green, usually turning red or yellow in autumn. ***Bark*** Dark gray and smooth. ***Flowers*** ⅜ in (1 cm) across, white, with five petals, fragrant, borne in upright, spreading, or drooping racemes to 6 in (15 cm) long, in mid- to late spring. ***Fruit*** A rounded to egg-shaped, glossy black berry, to 5/16 in (8 mm) long.

• **NATIVE REGION**
N. Asia, Europe.

• **HABITAT**
Open places, by streams, woods.

PRUNUS ▷ PADUS

◁ **'WATERERI'**
Slender, compact flower racemes, to 8 in (20 cm) long, distinguish this form of the species.

'COLORATA' ▷
This form has red-purple young leaves, which mature to dark green above and red on the underside.

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

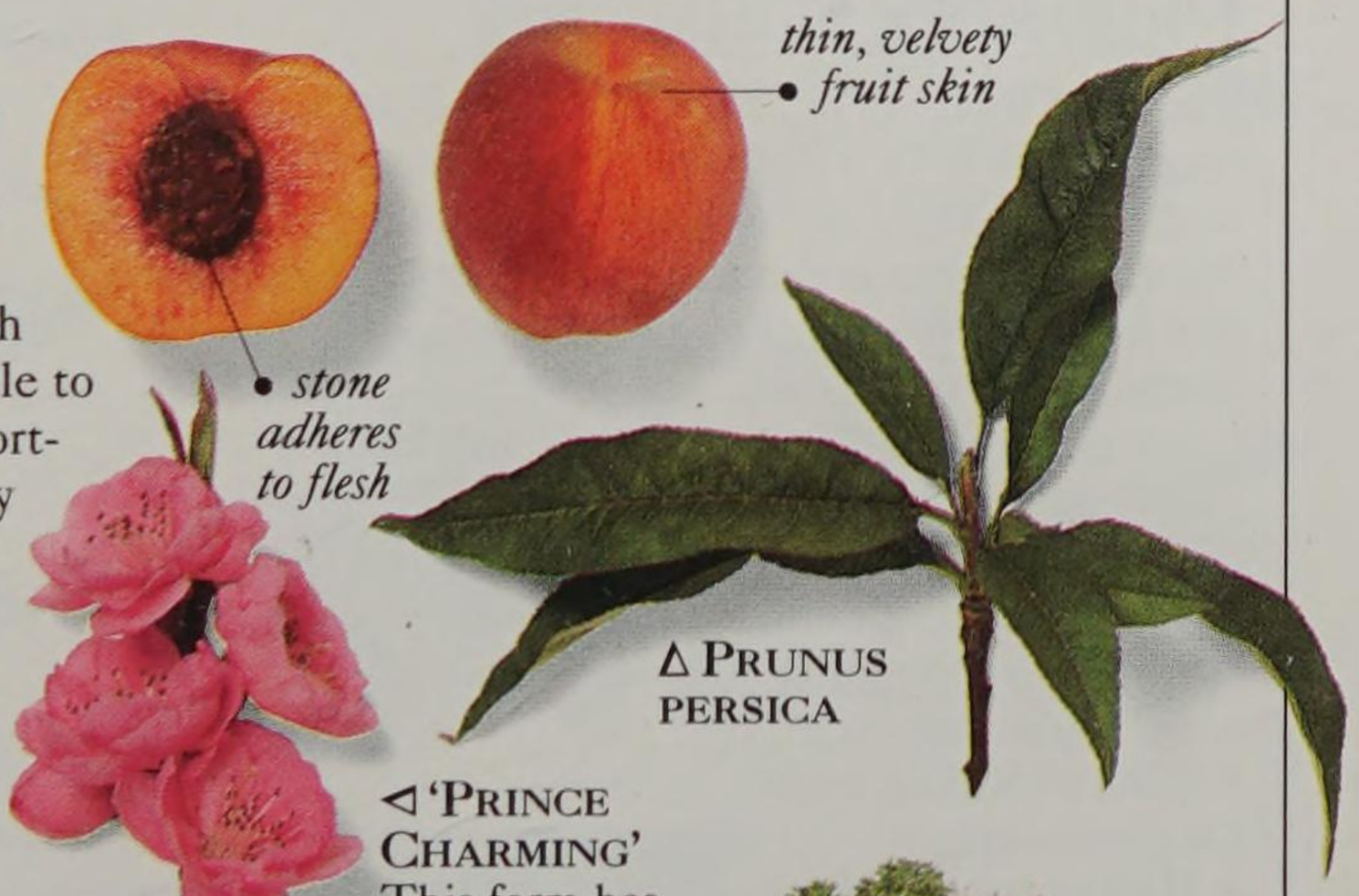
Family ROSACEAE	Species *Prunus persica*	Author (Linnaeus) Batsch

PEACH

Leaves Narrowly elliptic to lanceolate, to 6 in (15 cm) long and 1½ in (4 cm) across, with a long, slender point at the tip, finely toothed, glossy dark green. ***Bark*** Dark gray, becoming fissured with age. ***Flowers*** To 1½ in (4 cm) across, pale to deep pink or red, sometimes white, short-stalked, borne singly or in pairs, in early spring. ***Fruit*** Rounded, fleshy, sweet, edible, usually orange-yellow flushed red, to 3 in (7.5 cm) across, enclosing a deeply pitted, furrowed stone with a white seed.

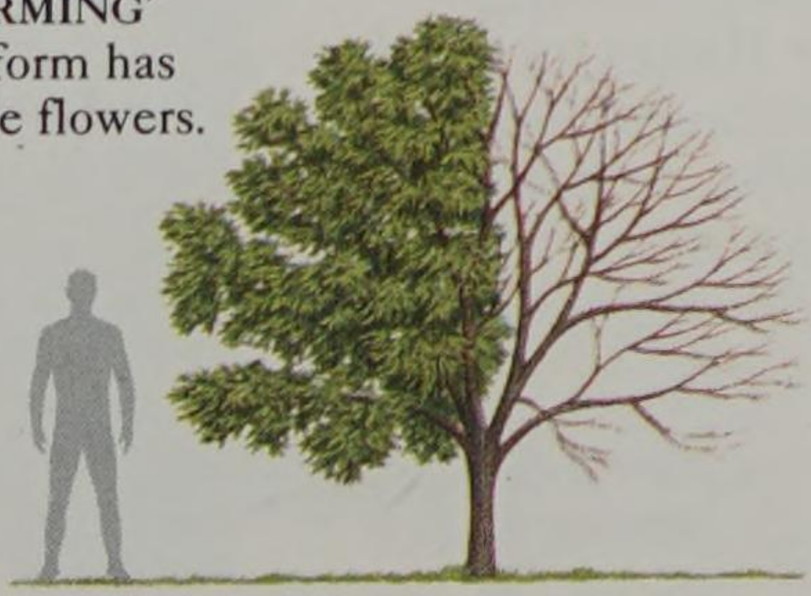
• **NATIVE REGION** China.

• **HABITAT** Mountains.



△ **PRUNUS PERSICA**

◁ **'PRINCE CHARMING'**
This form has double flowers.



▷ **VAR. NECTARINA**
The fruit of this variety has a smooth and slightly oily skin.

Height 26 ft (8 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

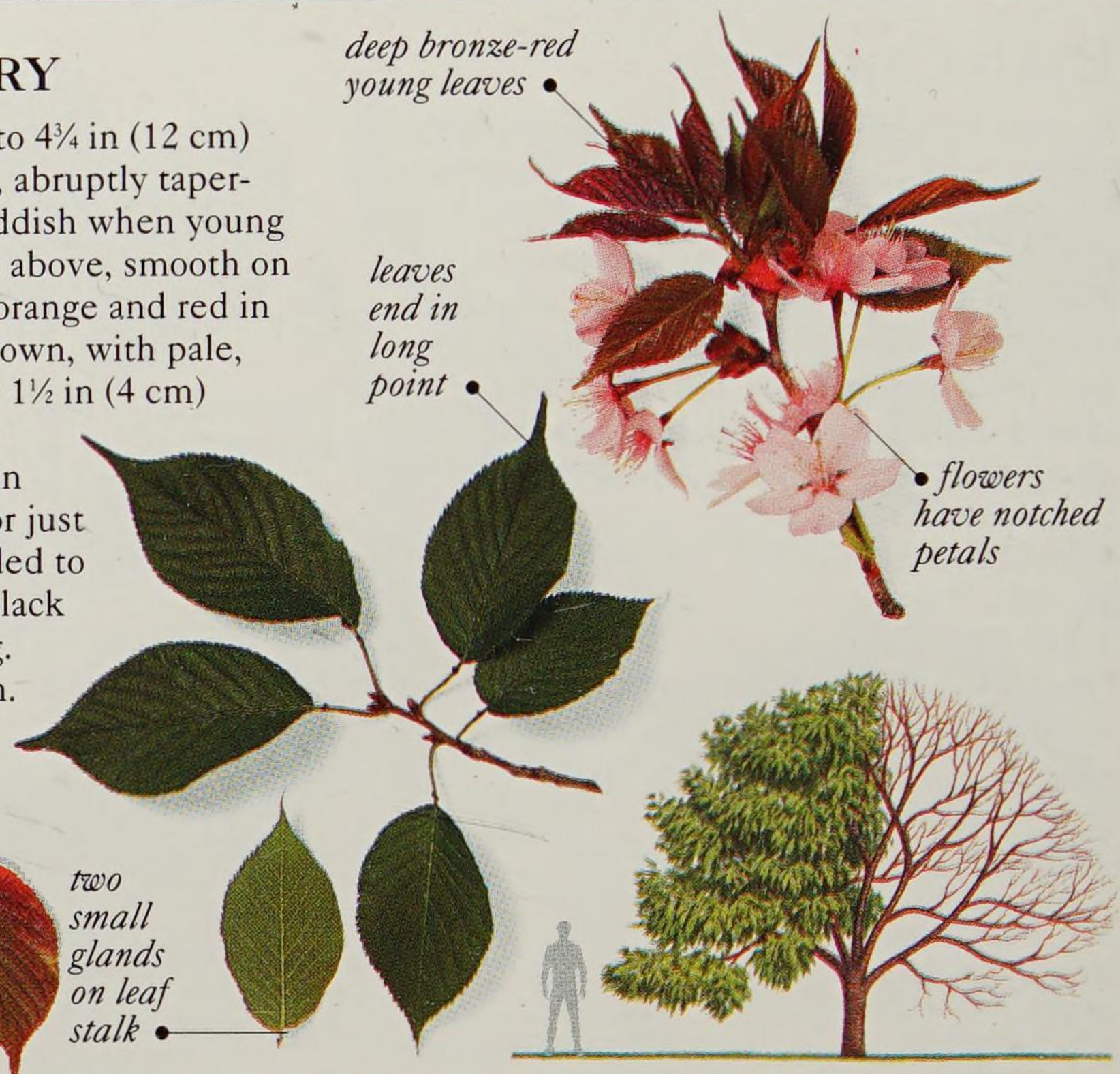
Family ROSACEAE	Species *Prunus sargentii*	Author Rehder

SARGENT CHERRY

Leaves Elliptic to obovate, to 4¾ in (12 cm) long and 2½ in (6 cm) across, abruptly taper-pointed, sharply toothed, reddish when young becoming deep glossy green above, smooth on both sides, turning brilliant orange and red in autumn. ***Bark*** Glossy red-brown, with pale, horizontal lenticels. ***Flowers*** 1½ in (4 cm) across, pink, with five petals notched at the tip, opening in clusters in mid-spring with or just before leaves. ***Fruit*** A rounded to egg-shaped, glossy, purple-black berry, about ⅜ in (1 cm) long.

• **NATIVE REGION** Japan.

• **HABITAT** Woods in mountains.



Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Prunus* x *schmittii*	Author Rehder

PRUNUS X SCHMITTII

Leaves Elliptic to obovate, to 4½ in (11 cm) long and 2¼ in (5.5 cm) across, taper-pointed at the tip, sharply and coarsely toothed at the margin, dark green above, paler beneath, softly downy on both sides. ***Bark*** Purple-red, with horizontal rows of corky, orange-brown lenticels, peeling in narrow, horizontal bands. ***Flowers*** Individually ¾ in (2 cm) across, deep pink in bud becoming pale pink, with five cupped petals, opening in clusters in mid-spring with the young leaves. ***Fruit*** Not usually produced.

• **NATIVE REGION** Of garden origin.

• **REMARK** A hybrid between sweet cherry (*Prunus avium*, see p.258) and the shrubby *Prunus canescens*.

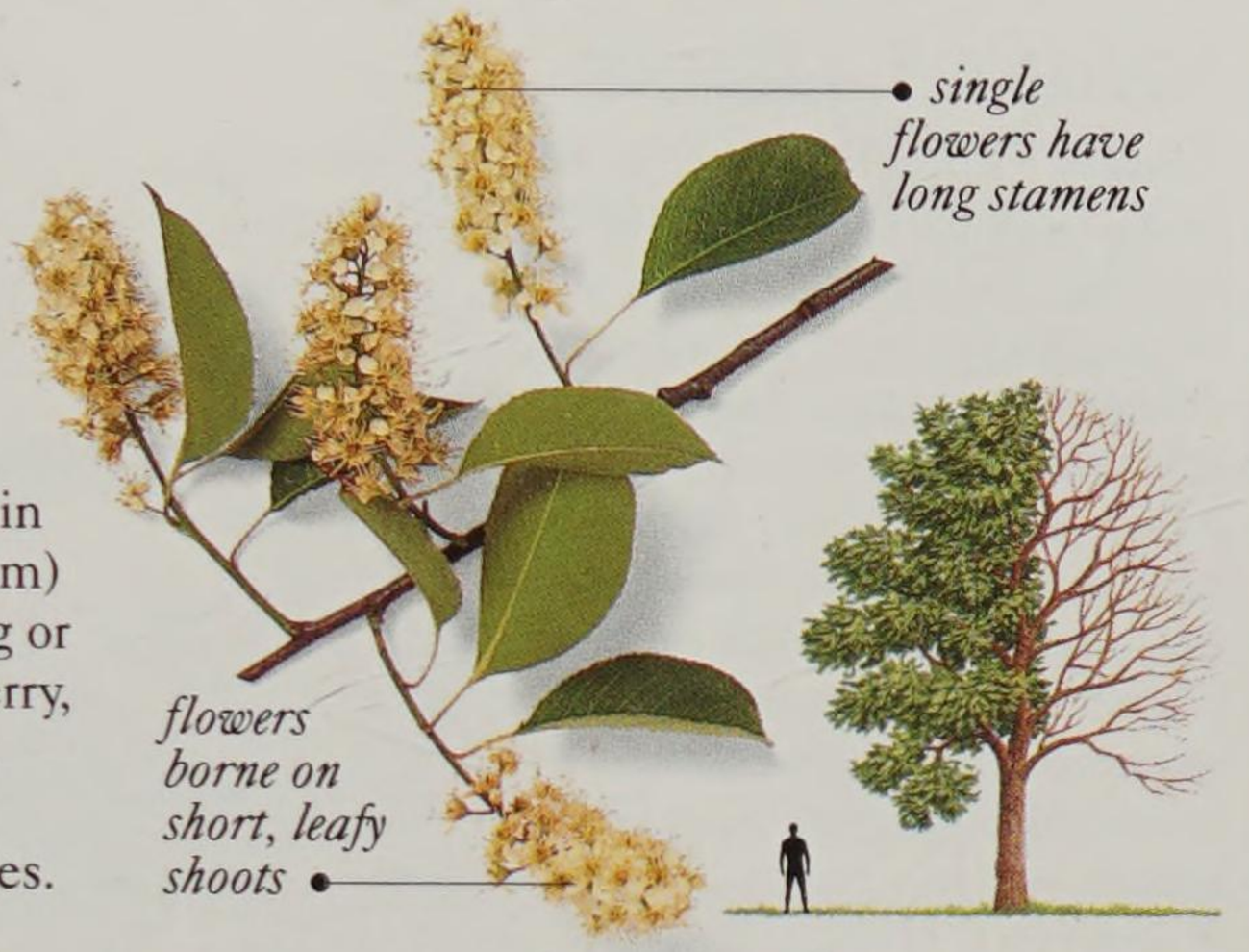
Height 50 ft (15 m)	Shape Narrowly columnar	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Prunus serotina*	Author Ehrhart

BLACK CHERRY

Leaves Elliptic to lanceolate, to 4¾ in (12 cm) long and 2 in (5 cm) across, taper-pointed, finely toothed, glossy dark green and smooth above, paler and smooth with hairs along the midrib beneath, turning yellow or red in autumn. ***Bark*** Dark gray, smooth. ***Flowers*** ⅜ in (1 cm) across, white, in spreading to drooping racemes to 6 in (15 cm) long, at the ends of the shoots in late spring or early summer. ***Fruit*** A rounded, edible cherry, to ⅜ in (1 cm) across, red ripening to black.

- **NATIVE REGION** North America.
- **HABITAT** Woods, pastures, and roadsides.



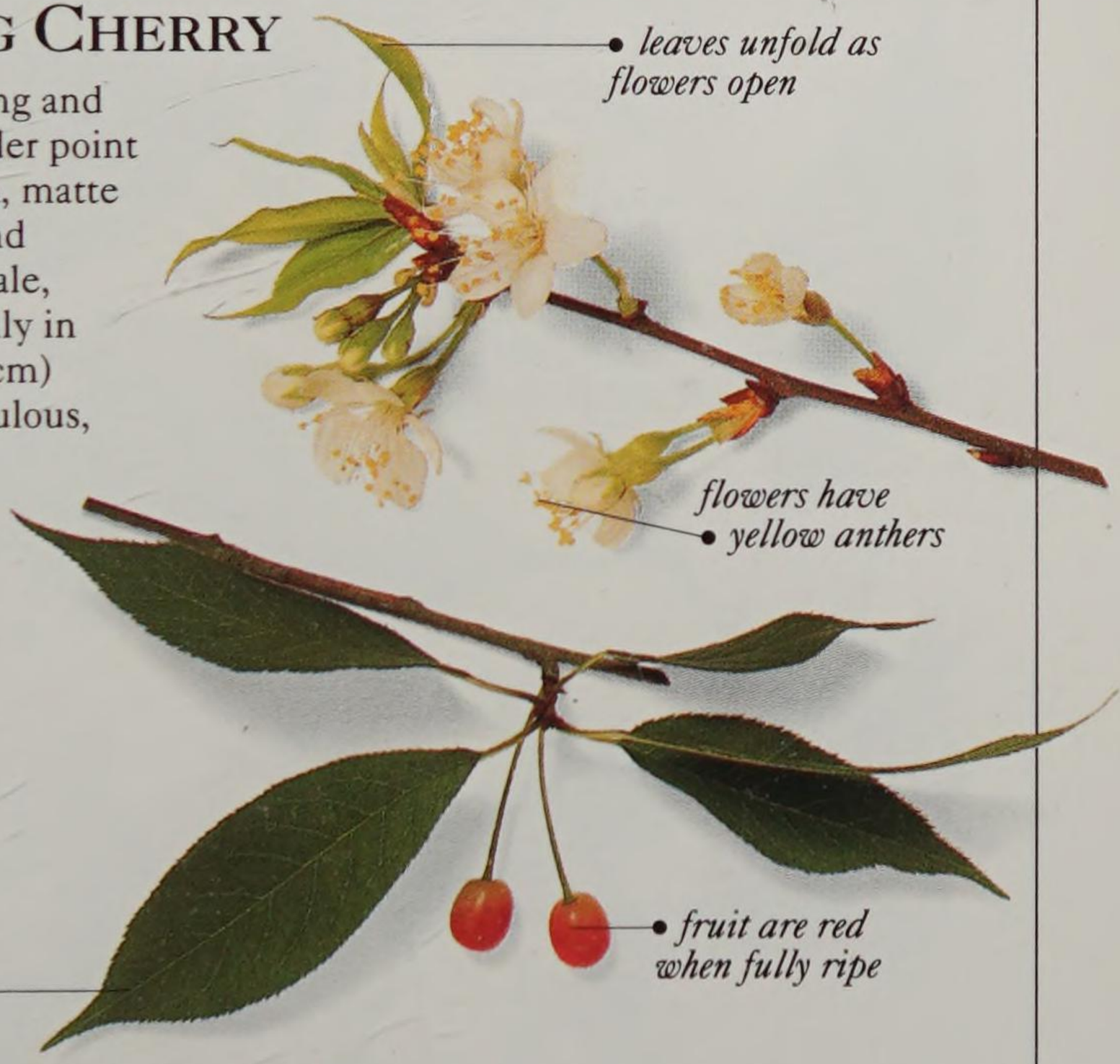
Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Prunus serrula*	Author Franchet

JAPANESE FLOWERING CHERRY

Leaves Lanceolate, to 4 in (10 cm) long and 1¼ in (3 cm) across, tapering to a slender point at the tip, finely toothed at the margin, matte dark green. ***Bark*** Glossy red-brown and smooth, conspicuously banded with pale, horizontal lenticels, peeling horizontally in narrow strips. ***Flowers*** White, ¾ in (2 cm) across, relatively inconspicuous, pendulous, borne singly or in small clusters of up to three in spring just after the young leaves emerge. ***Fruit*** Egg-shaped, about ⅜ in (1 cm) long, yellow at first ripening to red.

- **NATIVE REGION** W. China.
- **HABITAT** Mountain woods.
- **REMARK** Also known as *Prunus serrula* var. *tibetica*. This species is easily distinguished by its characteristic bark.



Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Prunus* x *subhirtella*	Author Miquel

SPRING CHERRY

Leaves Elliptic to ovate, to 3 in (7.5 cm) long and 2 in (5 cm) across, taper-pointed, sharply toothed, pale bronze when young becoming deep green above, paler beneath, turning yellow in autumn. ***Bark*** Gray-brown and smooth, banded with horizontal lenticels. ***Flowers*** Individually ¾ in (2 cm) across, pale pink or white, with five petals notched at the tip, opening from pink buds, in small clusters in early spring either before or as the young leaves emerge. ***Fruit*** A nearly black cherry, 5/16 in (8 mm) across, sparsely borne.

- **NATIVE REGION** Japan.
- **HABITAT** In woods with the parents.
- **REMARK** A naturally occurring hybrid between Fuji cherry *(Prunus incisa*, see p.261) and *Prunus pendula*. It is seen only rarely in the wild, but has many garden forms. 'Autumnalis' is one of the most commonly cultivated varieties.

'AUTUMNALIS' ▷
The semidouble flowers of this form are white, tinged with pale pink. They open in autumn, during mild periods in winter, and in spring.

Δ 'AUTUMNALIS ROSEA'
The semi-double flowers of this cultivar are very similar to those of 'Autumnalis,' but are deeper pink both in bud and when open. Like 'Autumnalis,' it flowers during mild weather in winter, and in spring.

Height 20 ft (6 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

leaves unfold pale green and thin

'PENDULA ROSEA'

fine, regularly spaced teeth at leaf margin

single flowers borne in dense clusters

petals have notched tip

cherry fruits ripen in color from deep red to nearly black

leaves mature to dark green

flowers borne bunched together along reddish shoots

∇ 'PENDULA ROSEA'
The single, pale pink flowers of this form are borne on weeping branches. 'Pendula Rubra' is similar in habit, but has darker flowers. Both of these forms may belong not to *P.* x *subhhirtella*, but to *P. pendula*, and are of Japanese origin.

◁ 'STELLATA'
The name describes the narrow-petalled, starry flowers of this cultivar. This very ornamental and profusely flowering form was raised in the United States, where it is also known as 'Pink Star.'

Family ROSACEAE	Species *Prunus verecunda*	Author (Koidzumi) Koehne

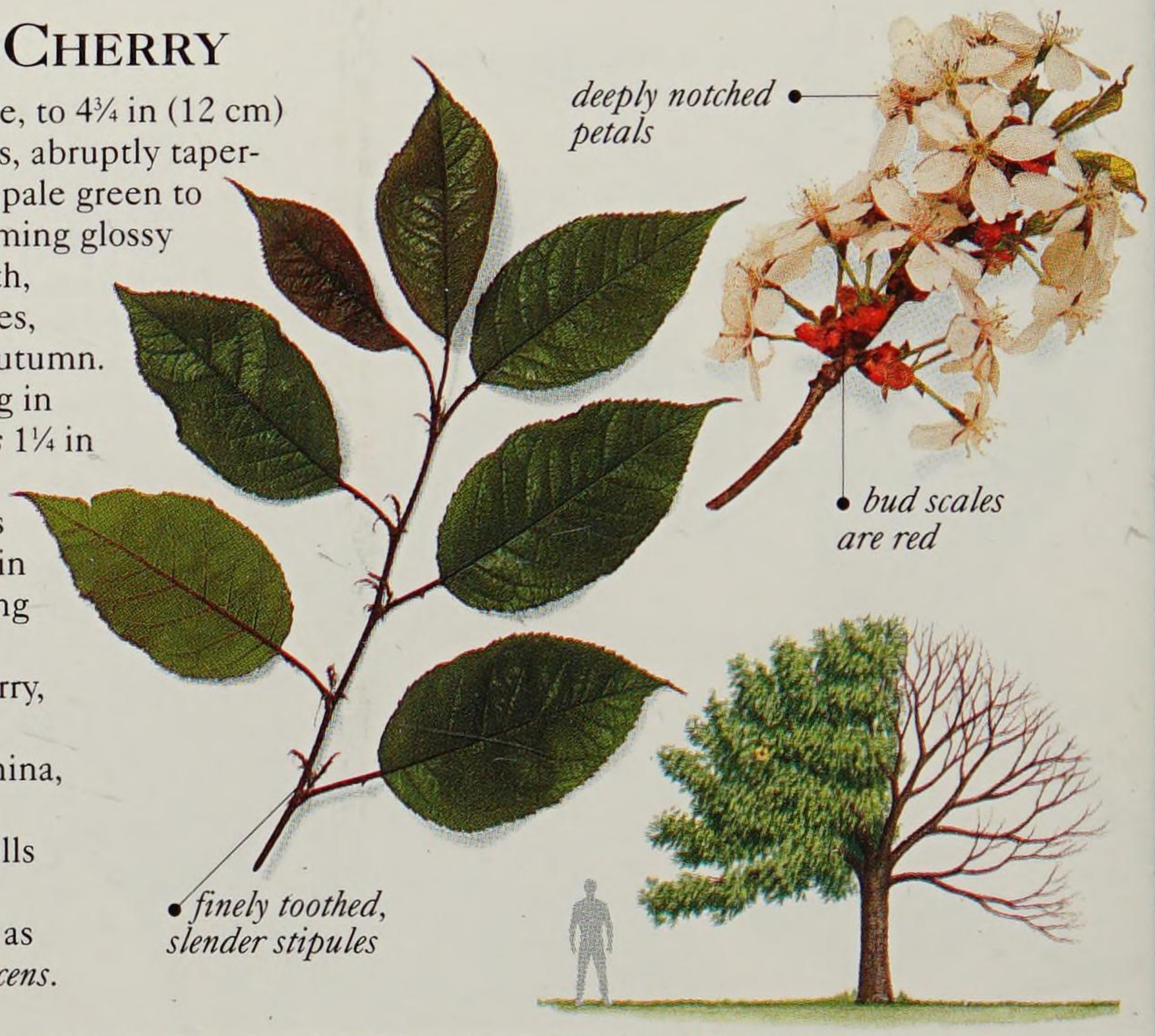
KOREAN HILL CHERRY

Leaves Elliptic to obovate, to 4¾ in (12 cm) long and 2 in (5 cm) across, abruptly taper-pointed, sharply toothed, pale green to bronze when young becoming glossy green above, paler beneath, downy on one or both sides, turning red to purple in autumn. ***Bark*** Gray-brown, peeling in horizontal bands. ***Flowers*** 1¼ in (3 cm) across, white or pale pink, with five petals notched at the tip, borne in small clusters in mid-spring before or with the leaves. ***Fruit*** A red to purple cherry, to ⅜ in (1 cm) across.

• **NATIVE REGION** China, Japan, Korea.

• **HABITAT** Woods in hills and mountains.

• **REMARK** Also known as *Prunus serrulata* var. *pubescens*.



Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Prunus* x *yedoensis*	Author Matsumura

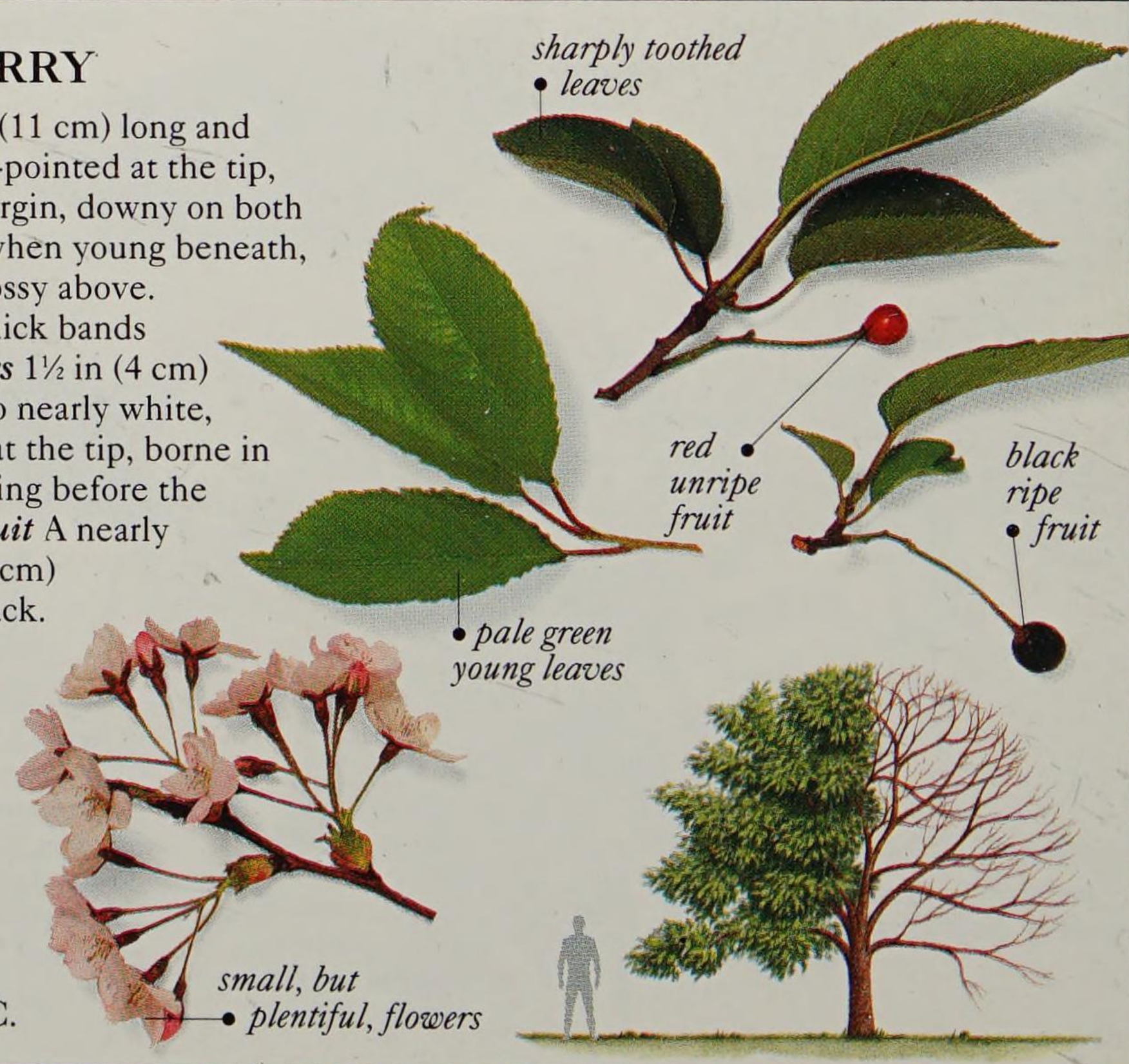
YOSHINO CHERRY

Leaves Elliptic, to 4½ in (11 cm) long and 2½ in (6 cm) across, taper-pointed at the tip, sharply toothed at the margin, downy on both sides but particularly so when young beneath, becoming smooth and glossy above. ***Bark*** Purple-gray, with thick bands of corky lenticels. ***Flowers*** 1½ in (4 cm) across, pale pink fading to nearly white, with five petals notched at the tip, borne in small clusters in early spring before the young leaves emerge. ***Fruit*** A nearly rounded cherry, ½ in (1.2 cm) across, red ripening to black.

• **NATIVE REGION** Japan.

• **HABITAT** Woods in hills together with the parent plants.

• **REMARK** Probably a hybrid with several named cultivars. A major planting is at the Tidal Basin in Washington, D.C.



Height 40 ft (12 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

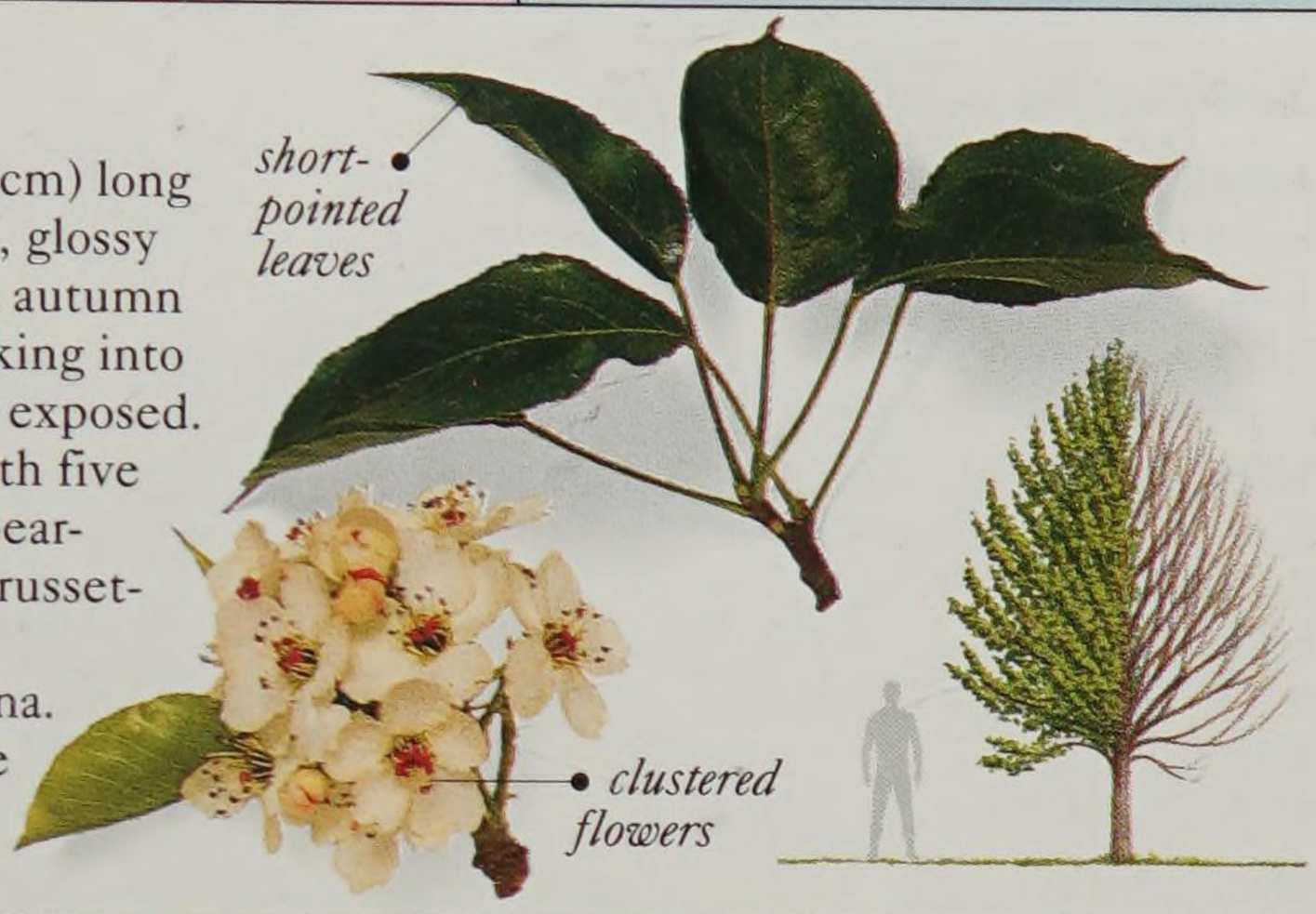
Family ROSACEAE	Species *Pyrus calleryana*	Author Decaisne

CALLERY PEAR

Leaves Ovate to elliptic, to 3 in (7.5 cm) long and 2 in (5 cm) across, finely toothed, glossy above, smooth, turning red-purple in autumn or early winter. ***Bark*** Dark gray, cracking into scaly ridges; red-brown when freshly exposed. ***Flowers*** ⅜ in (1 cm) across, white, with five petals, in spring. ***Fruit*** Rounded to pear-shaped, fleshy, to ¾ in (2 cm) across, russet-brown spotted with white

• **NATIVE REGION** C. and S. China.

• **HABITAT** Thickets and alongside streams in mountains.



Height 50 ft (15 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Pyrus communis*	Author Linnaeus

COMMON PEAR

Leaves Ovate to elliptic, to 4 in (10 cm) long and 2 in (5 cm) across, rounded to heart-shaped at the base, taper-pointed, toothed, glossy deep green. ***Bark*** Dark gray, cracking into small plates. ***Flowers*** To 1½ in (4 cm) across, white, with five petals and deep pink anthers, in clusters in mid-spring. ***Fruit*** Rounded to pear-shaped, fleshy, sweet, edible, greenish to russet or yellow, sometimes flushed red, to 4 in (10 cm) long.

• **NATIVE REGION** Of garden origin.

• **REMARK** A hybrid involving several species, which probably originated in W. Asia.

Height 50 ft (15 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

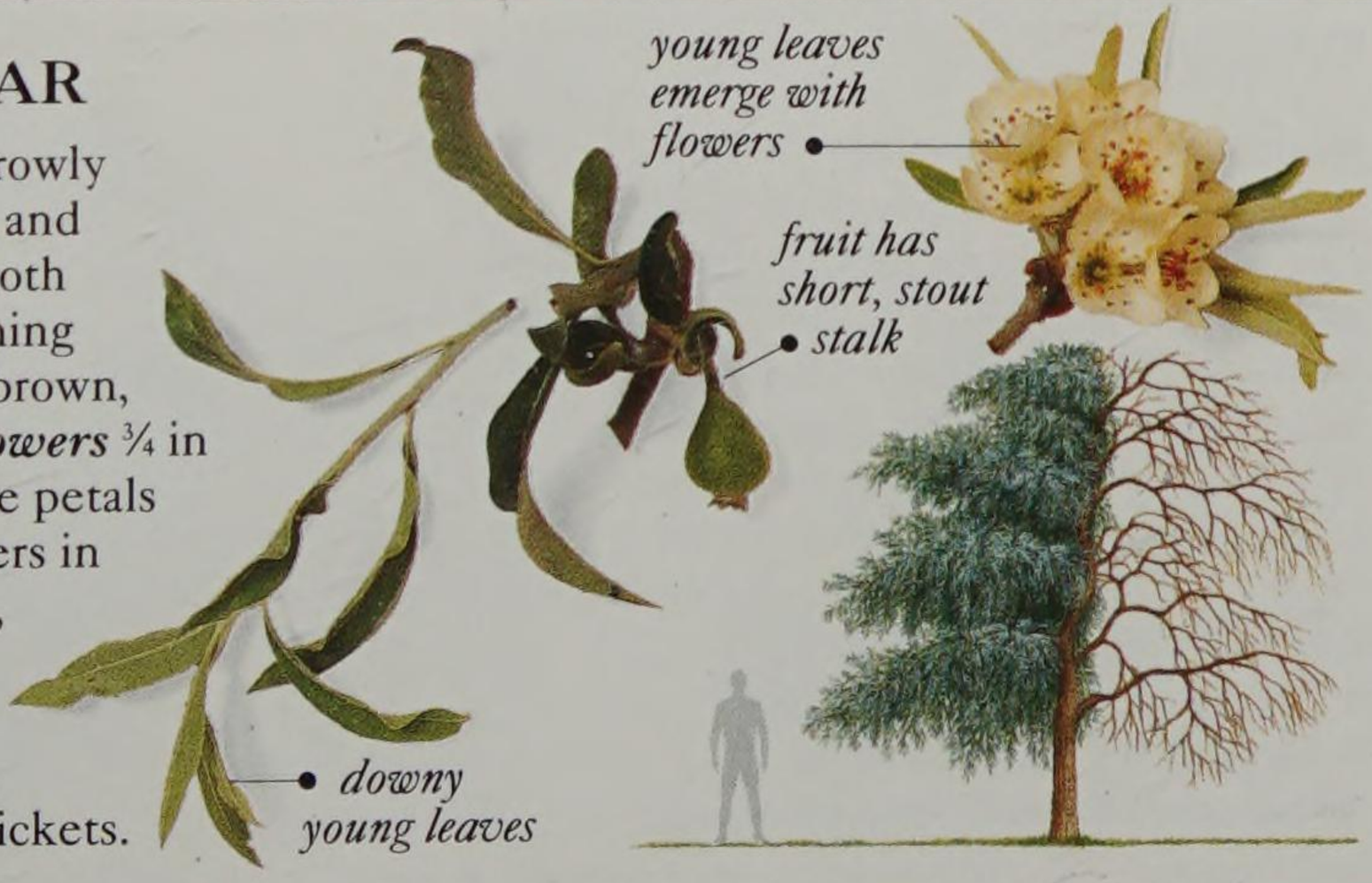
Family ROSACEAE	Species *Pyrus salicifolia*	Author Pallas

WILLOW LEAF PEAR

Leaves Narrowly elliptic to narrowly lanceolate, to 3½ in (9 cm) long and ¾ in (2 cm) across, tapering at both ends, usually untoothed, becoming smooth above. ***Bark*** Pale gray-brown, cracking into smooth plates. ***Flowers*** ¾ in (2 cm) across, creamy white, five petals and deep pink anthers, in clusters in spring. ***Fr***uit Pear-shaped, hard, green, to 1¼ in (3 cm) long.

• **NATIVE REGION** Caucasus, N.E. Turkey.

• **HABITAT** Wood margins, thickets.



Height 33 ft (10 m)	Shape Broadly weeping	Leaf persistence Deciduous	Leaf type

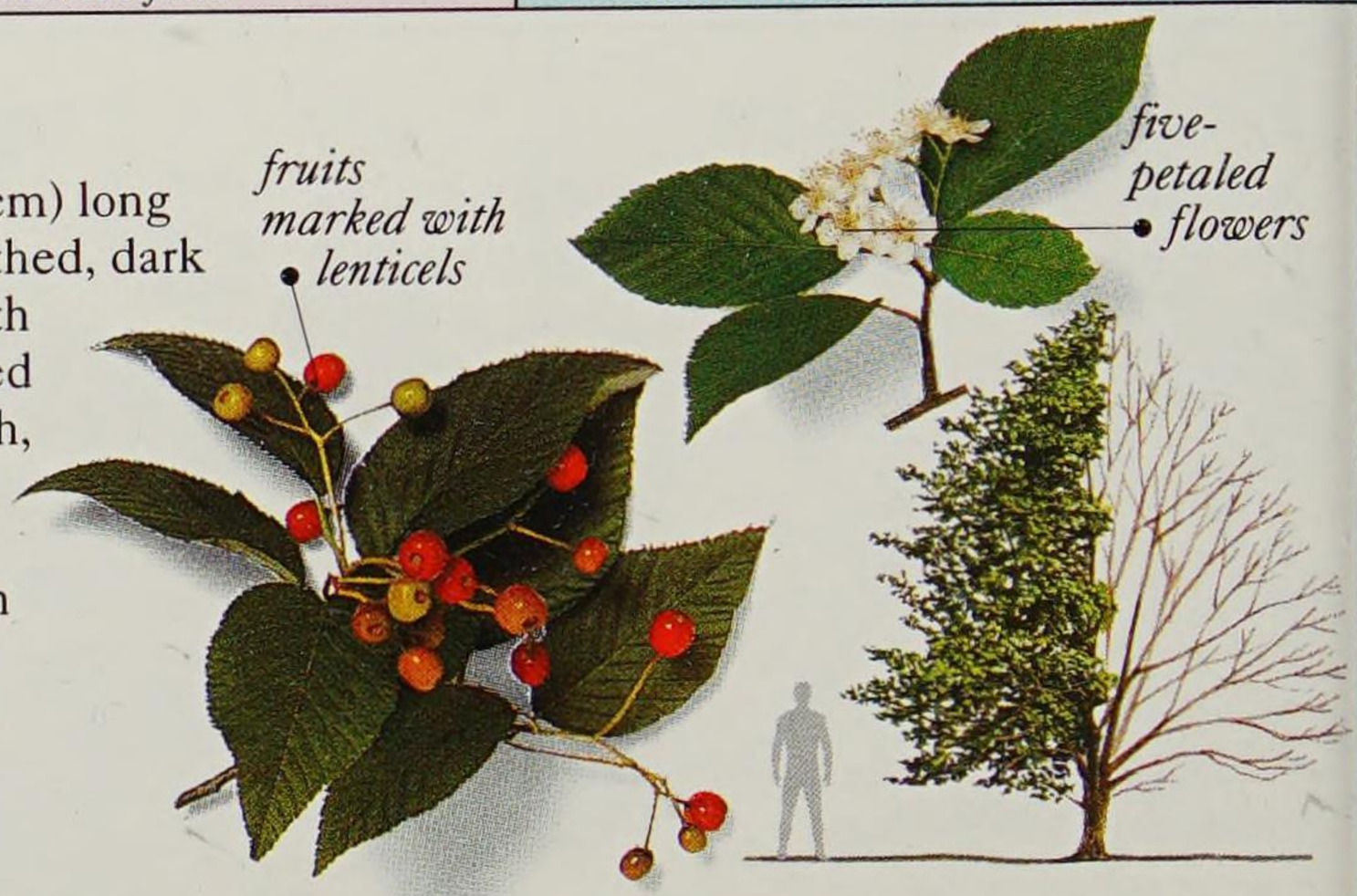
Family	Species	Author
ROSACEAE	*Sorbus alnifolia*	(Siebold & Zuccarini) K. Koch

SORBUS ALNIFOLIA

Leaves Ovate to elliptic, to 4 in (10 cm) long and 1½ in (4 cm) across, pointed, toothed, dark green above, downy becoming smooth beneath, turning yellow, orange, or red in autumn. ***Bark*** Dark brown, smooth, with shallow fissures. ***Flowers*** ⅜ in (1 cm) across, white, in clusters in mid-spring. ***Fruit*** A rounded, reddish berry, about ⅜ in (1 cm) across.

• **NATIVE REGION** China, Japan, Korea, Taiwan.

• **HABITAT** Woods.



Height	Shape	Leaf persistence	Leaf type
65 ft (20 m)	Broadly conical	Deciduous	

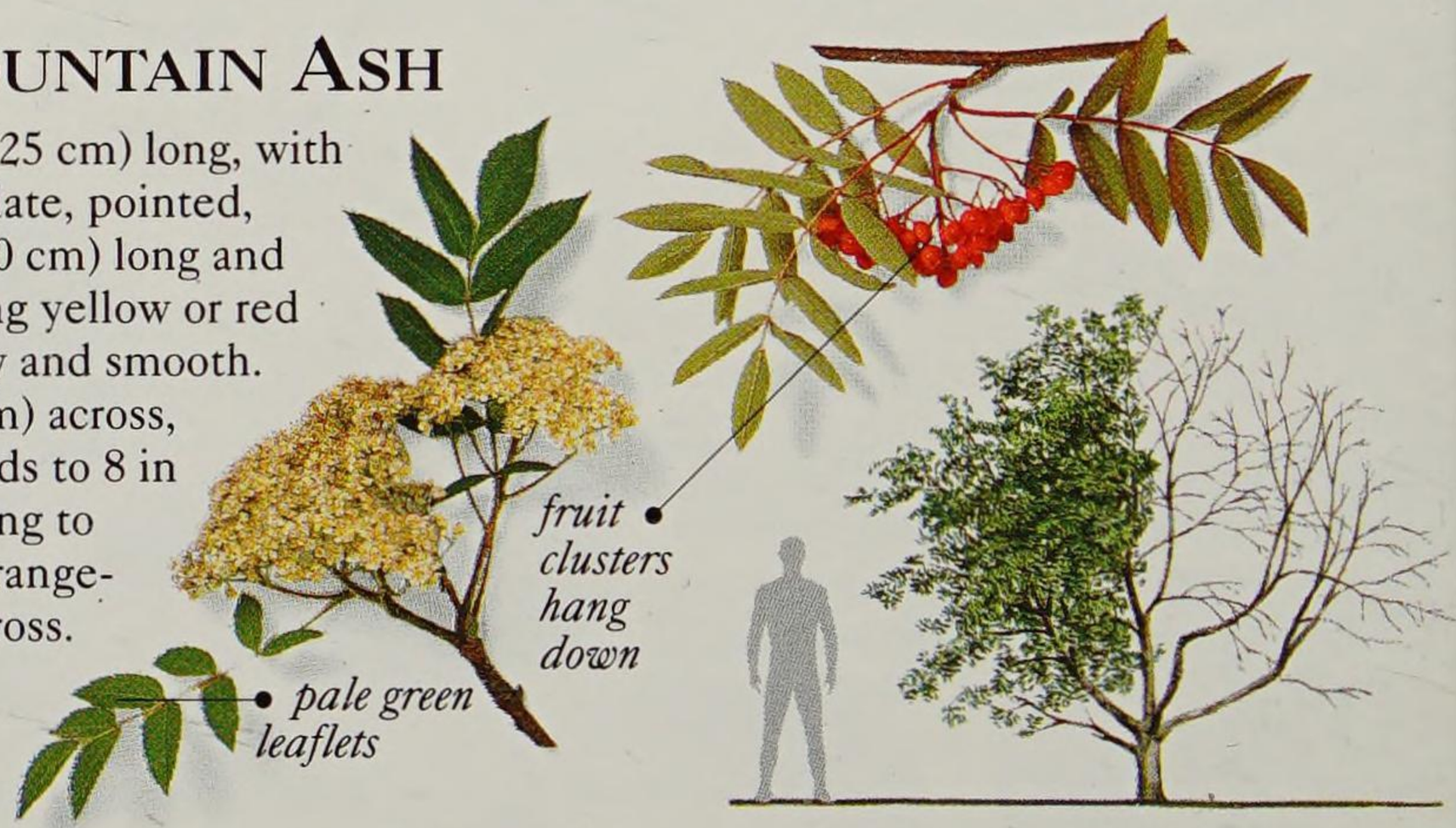
Family	Species	Author
ROSACEAE	*Sorbus americana*	Marshall

AMERICAN MOUNTAIN ASH

Leaves Pinnate, to 10 in (25 cm) long, with about 15 oblong to lanceolate, pointed, toothed leaflets, to 4 in (10 cm) long and 1 in (2.5 cm) across, turning yellow or red in late autumn. ***Bark*** Gray and smooth. ***Flowers*** About 3/16 in (5 mm) across, white, borne in dense heads to 8 in (20 cm) across, in late spring to early summer. ***Fruit*** An orange-red berry, 3/16 in (5 mm) across.

• **NATIVE REGION** E. North America.

• **HABITAT** Woods.



Height	Shape	Leaf persistence	Leaf type
26 ft (8 m)	Broadly spreading	Deciduous	

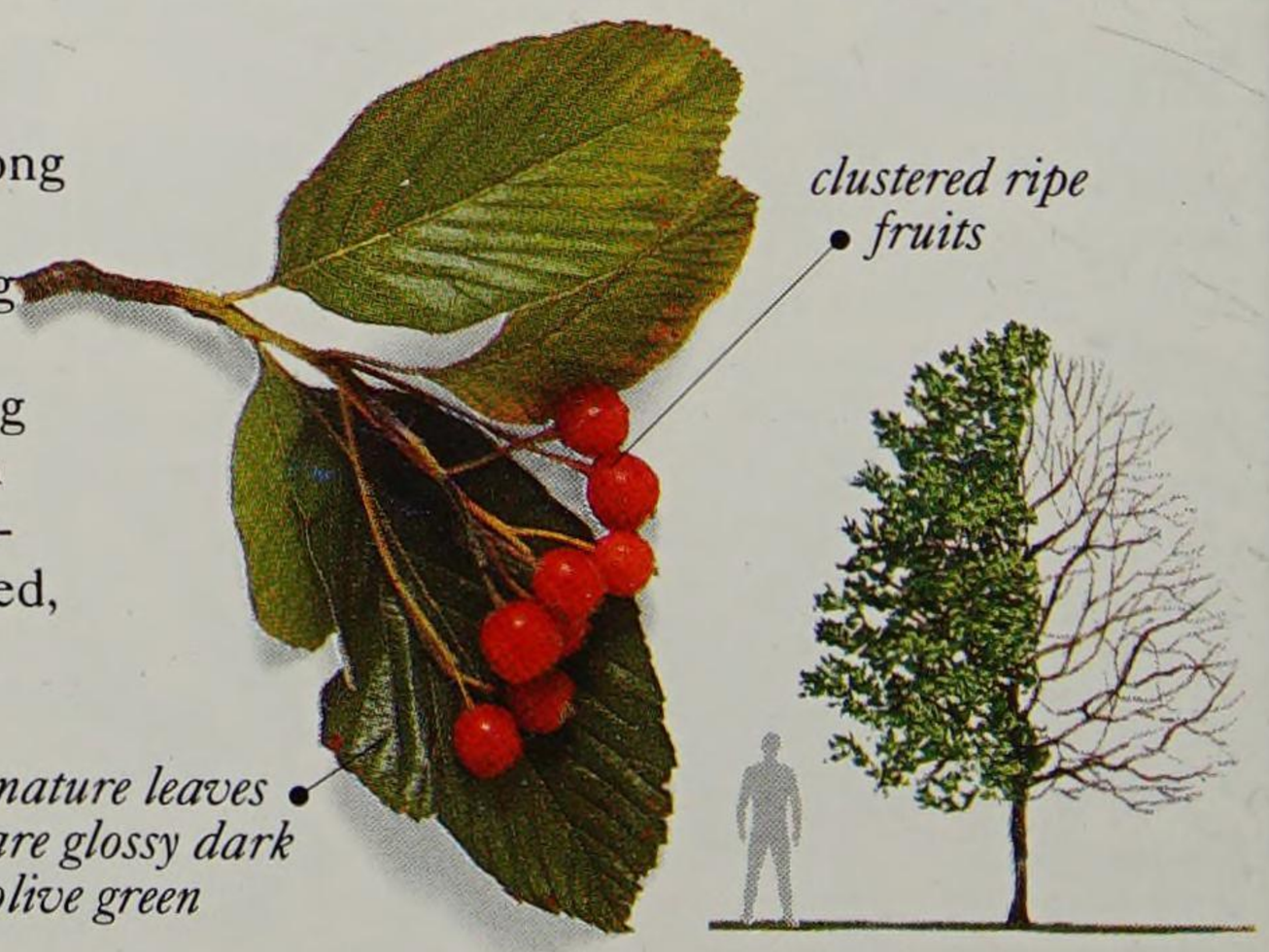
Family	Species	Author
ROSACEAE	*Sorbus aria*	(Linnaeus) Crantz

WHITEBEAM

Leaves Elliptic to ovate, to 4¾ in (12 cm) long and 2½ in (6 cm) across, sharply toothed, pale green with hairs when young becoming glossy dark green above, white with hairs beneath. ***Bark*** Gray and smooth, developing rugged cracks with age. ***Flowers*** About ⅜ in (1 cm) across, white, with five petals, in flattened clusters in late spring. ***Fruit*** A rounded, bright red berry, about ½ in (1.2 cm) across, speckled with pale lenticels.

• **NATIVE REGION** Europe.

• **HABITAT** From lowland to mountains, on chalk and limestone.



Height	Shape	Leaf persistence	Leaf type
50 ft (15 m)	Broadly columnar	Deciduous	

Family ROSACEAE	Species *Sorbus aucuparia*	Author Linnaeus

ROWAN

Leaves Pinnate, to 8 in (20 cm) long, with up to 15 taper-pointed, sharply toothed leaflets, to 2½ in (6 cm) long, dark green and smooth above, blue-green and usually downy when young beneath, sometimes turning red in autumn. ***Bark*** Gray and smooth. ***Flowers*** 5/16 in (8 mm) across, white, with five petals, in clusters to 6 in (15 cm) across, in late spring. ***Fruit*** A rounded, orange-red berry, 5/16 in (8 mm) across, often forming heavy clusters.

• **NATIVE REGION** Asia, Europe.

• **HABITAT** Woods, heath-land, moors, and mountains, on moist, acid soil.

• **REMARK** Also known as European mountain ash, mountain ash. The berries are used for making jellies and preserves, but can be poisonous if consumed raw.

◁ **'ASPLENIIFOLIA'** This form has oblong, very sharply toothed leaflets.

fruits borne in large, dense, pendulous clusters

fluffy, exserted flower stamens

smallest leaflet at end of leaf

Height 50 ft (15 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Sorbus cashmiriana*	Author Hedlund

SORBUS CASHMIRIANA

Leaves Pinnate, to 6 in (15 cm) long, with about 17 toothed leaflets, to 2 in (5 cm) long and 5/8 in (1.5 cm) across, deep green above, gray-green beneath, becoming smooth on both sides, turning yellow in autumn. ***Bark*** Smooth, gray to reddish gray. ***Flowers*** 5/8 in (1.5 cm) across, pink, with five petals, in open clusters to 4¾ in (12 cm) across, in late spring. ***Fruit*** Rounded berry, white tinged pink at first at the top, ½ in (1.2 cm) across, carried on red stalks.

• **NATIVE REGION** W. Himalayas.

• **HABITAT** Mountain woods.

leaflet margin edged with deep teeth

leaves change color in autumn

white ripe fruits

Height 26 ft (8 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

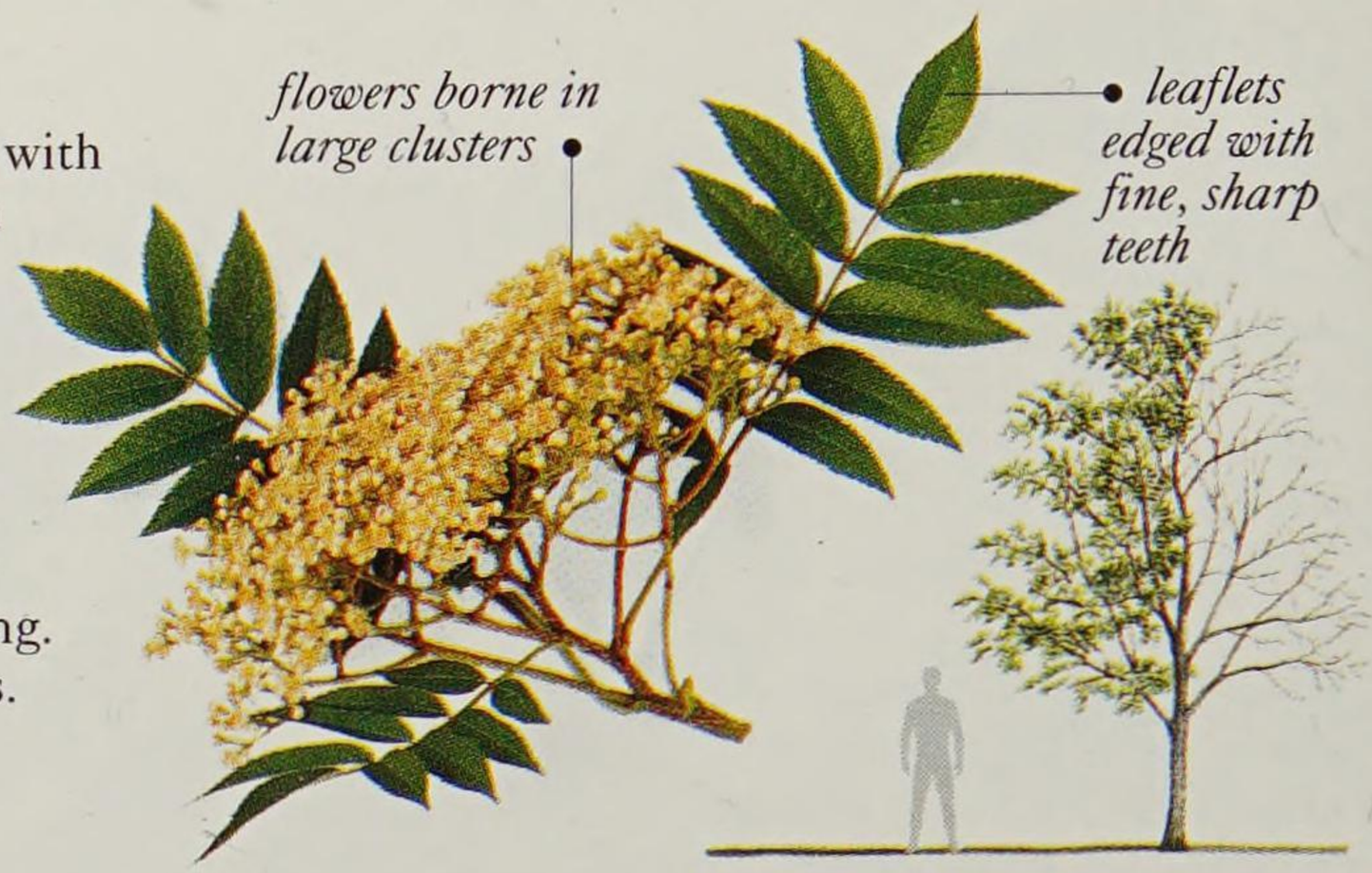
Family ROSACEAE	Species *Sorbus commixta*	Author Hedlund

SORBUS COMMIXTA

Leaves Pinnate, to 8 in (20 cm) long, with up to 15 taper-pointed leaflets, to 3 in (7.5 cm) long and 1 in (2.5 cm) across, glossy above, blue-green beneath, turning yellow to reddish purple in autumn. ***Bark*** Gray and smooth. ***Flowers*** 5/16 in (8 mm) across, white, with five petals, borne in clusters to 6 in (15 cm) across, in late spring. ***Fruit*** Orange-red, 5/16 in (8 mm) across.

• **NATIVE REGION** Japan, Korea.

• **HABITAT** Mountain forests.



Height 33 ft (10 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Sorbus domestica*	Author Linnaeus

SERVICE TREE

Leaves Pinnate, to 8¾ in (22 cm) long, with up to 21 oblong, toothed leaflets, to 2½ in (6 cm) long and about ⅜ in (1 cm) across, yellow-green and smooth above, downy when young beneath, turning yellow or red in autumn. ***Bark*** Dark brown, scaly, cracking into plates. ***Flowers*** To ⅝ in (1.5 cm) across, white, with five petals, in rounded clusters about 4 in (10 cm) across, in late spring. ***Fruit*** Rounded or pear-shaped, yellow-green flushed red, to 1¼ in (3 cm) long.

• **NATIVE REGION** S.W. Asia, E. and S. Europe.

• **HABITAT** Mountain slopes, deciduous forests.

VAR. PYRIFERA ▷
This form has bright red fruits shaped like miniature pears.

VAR. POMIFERA ▷
The fruits of this form resemble tiny apples.

Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Sorbus esserteauana*	Author Koehne

SORBUS ESSERTEAUANA

Leaves Pinnate, to 10 in (25 cm) long, with up to 15 taper-pointed leaflets, to 4 in (10 cm) long and 1½ in (4 cm) across, deep red-purple becoming glossy dark green and smooth above, gray-hairy when young beneath, turning red in autumn. ***Bark*** Gray-brown, thinly scaly. ***Flowers*** 5/16 in (8 mm) across, white, with five petals, borne in heads to 4¾ in (12 cm) across, in late spring. ***Fruit*** Red, 5/16 in (8 mm) across.

- **NATIVE REGION** S.W. China.
- **HABITAT** Mountains, cliffs, woods.

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Sorbus forrestii*	Author McAllister & Gillham

SORBUS FORRESTII

Leaves Pinnate, to 8 in (20 cm) long, with up to 17 leaflets, to 1½ in (4 cm) long and 5/8 in (1.5 cm) across, blue-green above, gray-green beneath, becoming smooth. ***Bark*** Purple-gray and smooth, with shallow, vertical fissures. ***Flowers*** 3/8 in (1 cm) across, white, with five petals, borne in flattened heads in late spring. ***Fruit*** Rounded, 3/8 in (1 cm) across, green ripening to white.

- **NATIVE REGION** S.W. China.
- **HABITAT** Mountain woods.

Height 20 ft (6 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Sorbus hupehensis*	Author Schneider

SORBUS HUPEHENSIS

Leaves Pinnate, to 6 in (15 cm) long, with up to 17 leaflets, to 2½ in (6 cm) long and ¾ in (2 cm) across, toothed towards the tip, blue-green above, blue-gray and smooth or nearly so beneath, turning red in autumn. ***Bark*** Gray and smooth. ***Flowers*** Individually ¼ in (6 mm) across, white, with five petals, in rounded clusters to 6 in (15 cm) across, in late spring. ***Fruit*** A rounded berry, about 5/16 in (8 mm) across, white flushed pink at the top.

- **NATIVE REGION** China.
- **HABITAT** Mountain woods.

Height 40 ft (12 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Sorbus intermedia*	Author (Ehrhart) Persoon

SWEDISH WHITEBEAM

Leaves Ovate or broadly elliptic, to 4 in (10 cm) long and 2½ in (6 cm) across, lobed, more deeply lobed towards the base of the leaf, toothed, glossy dark green above, gray-green and hairy beneath. ***Bark*** Gray, cracking and flaking with age. ***Flowers*** Individually ¾ in (2 cm) across, white, with five petals, in large, dense clusters to 4¾ in (12 cm) across, in late spring. ***Fruit*** A broadly egg-shaped, bright red berry, to 5/8 in (1.5 cm) long, with few lenticels.

- **NATIVE REGION** N.W. Europe.
- **HABITAT** Woods.

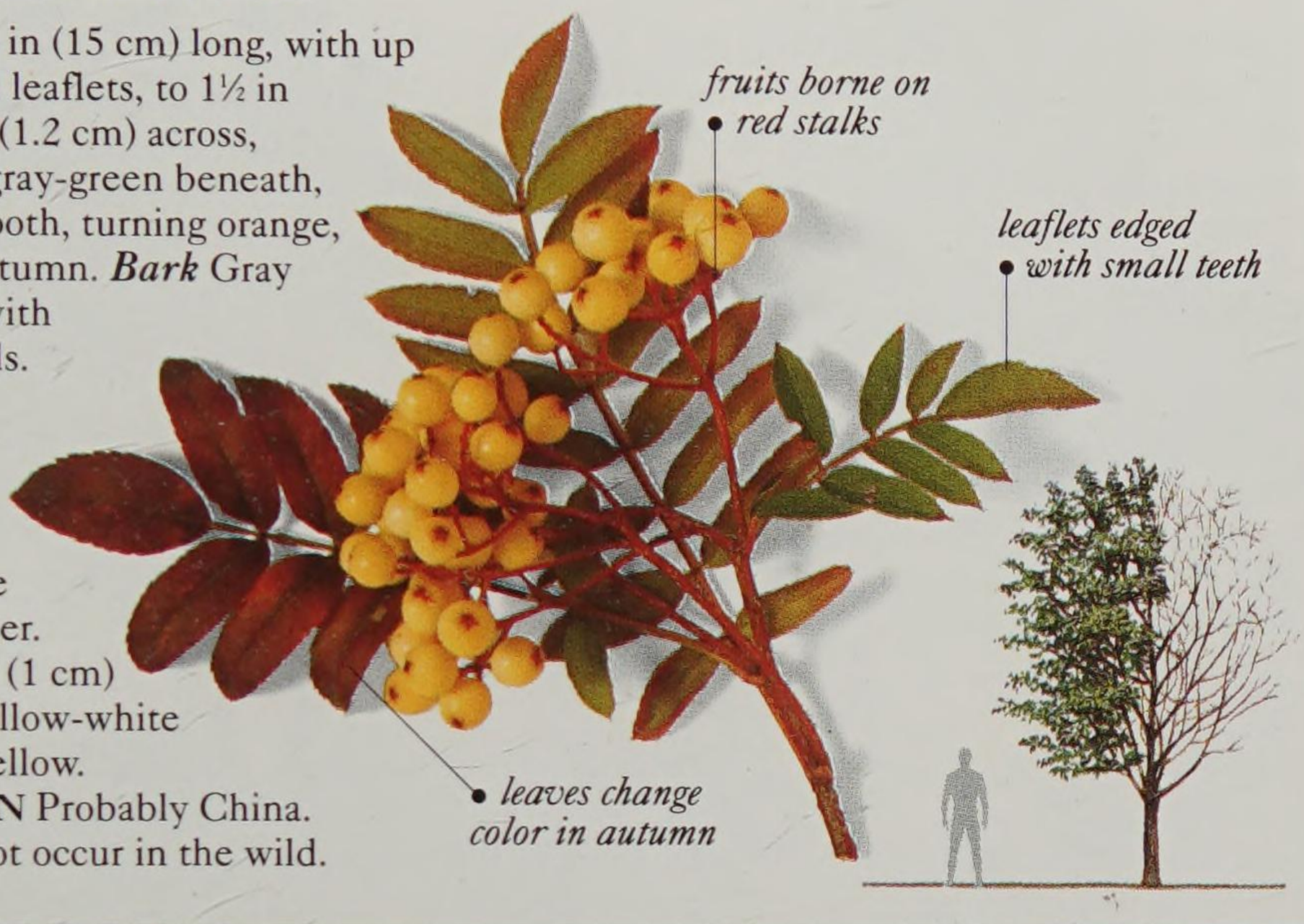
Height 50 ft (15 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Sorbus* 'Joseph Rock'	Author None

SORBUS 'JOSEPH ROCK'

Leaves Pinnate, to 6 in (15 cm) long, with up to 17 sharply toothed leaflets, to 1½ in (4 cm) long and ½ in (1.2 cm) across, bright green above, gray-green beneath, becoming nearly smooth, turning orange, red, and purple in autumn. ***Bark*** Gray and nearly smooth, with small, orange lenticels. ***Flowers*** ⅜ in (1 cm) across, white, with five petals, borne in flattened heads 4 in (10 cm) across, in late spring to early summer. ***Fruit*** Rounded, ⅜ in (1 cm) across, green then yellow-white ripening to orange-yellow.

- **NATIVE REGION** Probably China.
- **HABITAT** May not occur in the wild.



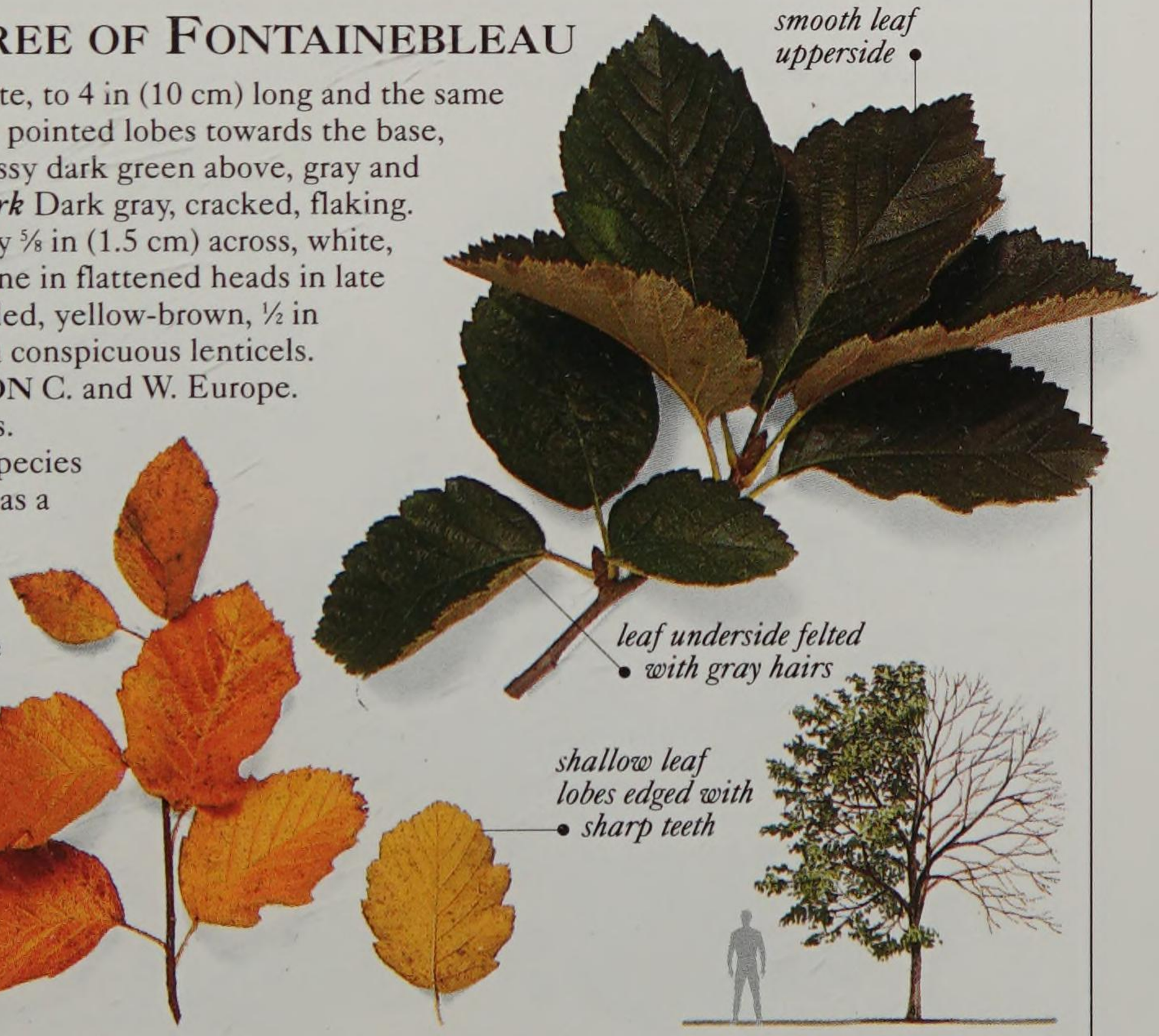
Height 33 ft (10 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Sorbus latifolia*	Author (Lamarck) Persoon

SERVICE TREE OF FONTAINEBLEAU

Leaves Broadly ovate, to 4 in (10 cm) long and the same across, with shallow, pointed lobes towards the base, sharply toothed, glossy dark green above, gray and downy beneath. ***Bark*** Dark gray, cracked, flaking. ***Flowers*** Individually ⅝ in (1.5 cm) across, white, with five petals, borne in flattened heads in late spring. ***Fruit*** Rounded, yellow-brown, ½ in (1.2 cm) across, with conspicuous lenticels.

- **NATIVE REGION** C. and W. Europe.
- **HABITAT** Woods.
- **REMARK** This species probably originated as a hybrid between the whitebeam *(Sorbus aria*, see p.274) and the wild service tree *(Sorbus torminalis*, see p.282).



Height 40 ft (12 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

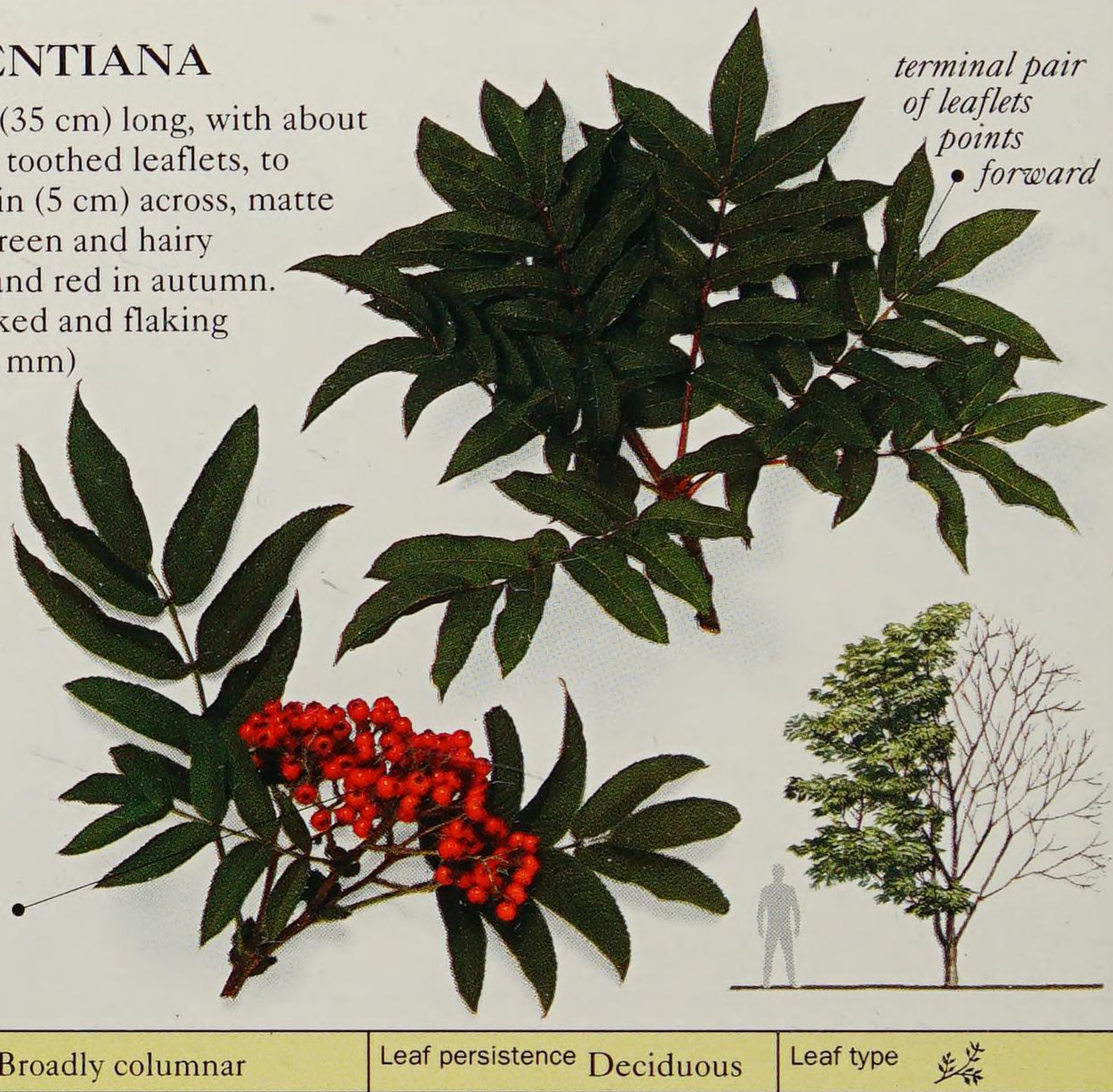
Family ROSACEAE	Species *Sorbus sargentiana*	Author Koehne

SORBUS SARGENTIANA

Leaves Pinnate, to 14 in (35 cm) long, with about 11 oblong, taper-pointed, toothed leaflets, to 4¾ in (12 cm) long and 2 in (5 cm) across, matte deep green above, gray-green and hairy beneath, turning orange and red in autumn. ***Bark*** Purple-brown, cracked and flaking with age. ***Flowers*** ¼ in (6 mm) across, white, in rounded heads to 8 in (20 cm) across, in early summer. ***Fruit*** Rounded, bright red, ¼ in (6 mm) across, borne in large clusters.

• **NATIVE REGION**
S.W. China.

• **HABITAT**
Mountain woods.



Height 33 ft (10 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

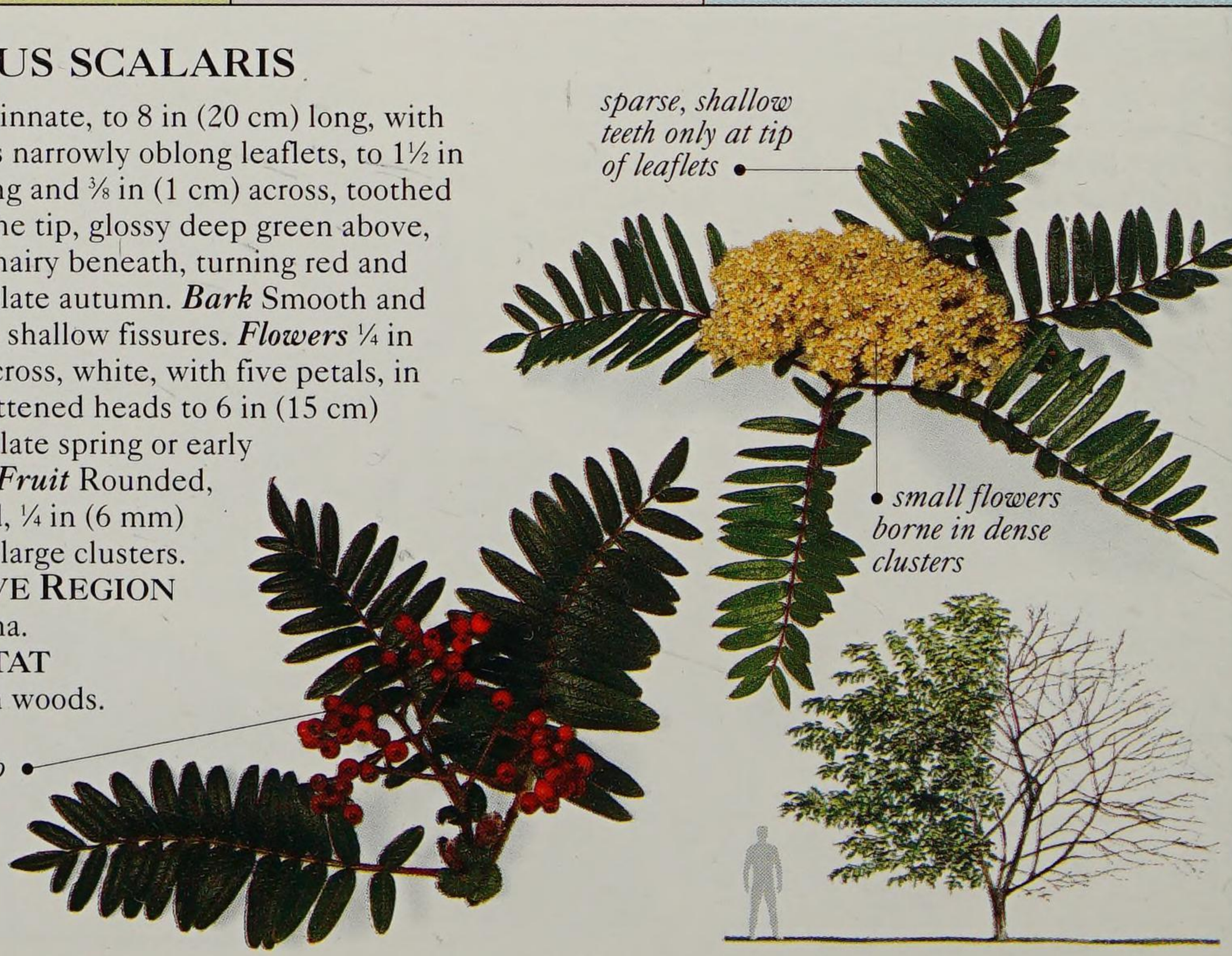
Family ROSACEAE	Species *Sorbus scalaris*	Author Koehne

SORBUS SCALARIS

Leaves Pinnate, to 8 in (20 cm) long, with numerous narrowly oblong leaflets, to 1½ in (4 cm) long and ⅜ in (1 cm) across, toothed towards the tip, glossy deep green above, gray and hairy beneath, turning red and purple in late autumn. ***Bark*** Smooth and gray, with shallow fissures. ***Flowers*** ¼ in (6 mm) across, white, with five petals, in broad, flattened heads to 6 in (15 cm) across, in late spring or early summer. ***Fruit*** Rounded, bright red, ¼ in (6 mm) across, in large clusters.

• **NATIVE REGION**
S.W. China.

• **HABITAT**
Mountain woods.



Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Sorbus thibetica*	Author (Cardot) Handel-Mazzetti

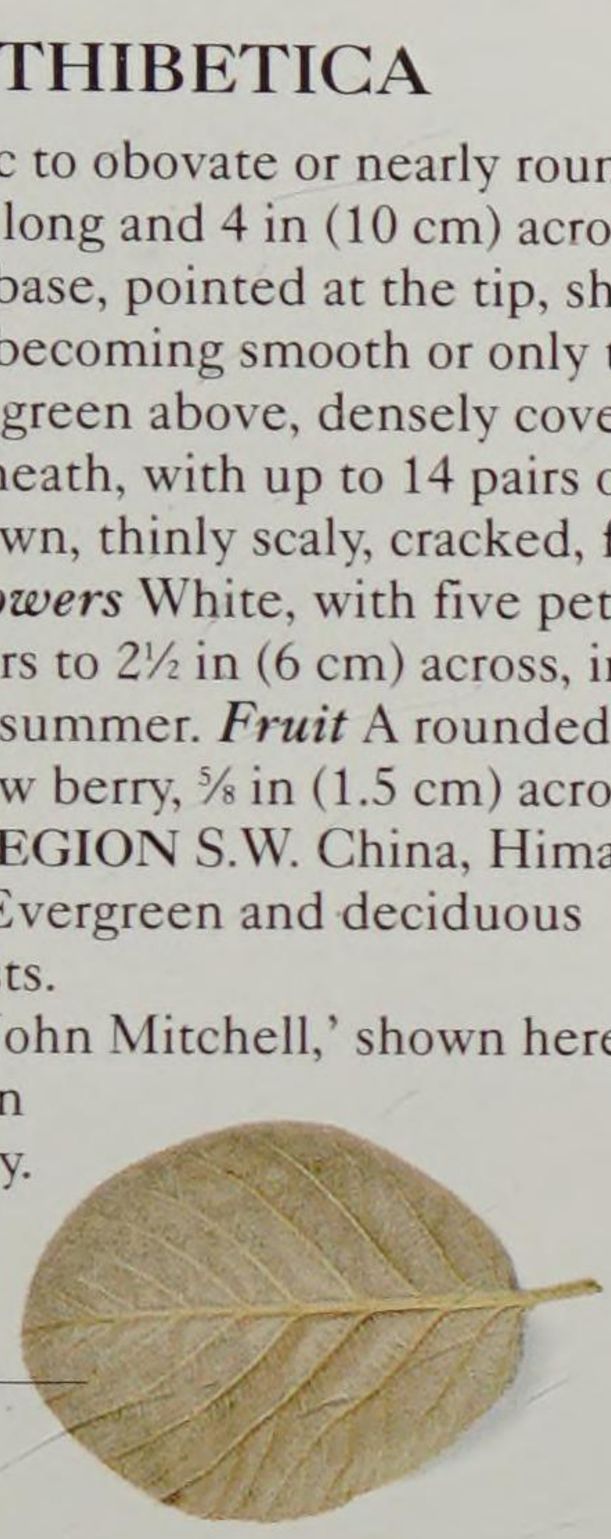
SORBUS THIBETICA

Leaves Elliptic to obovate or nearly rounded, to 6 in (15 cm) long and 4 in (10 cm) across, tapered at the base, pointed at the tip, sharply toothed, hairy becoming smooth or only thinly hairy and dark green above, densely covered in white hairs beneath, with up to 14 pairs of veins. ***Bark*** Gray-brown, thinly scaly, cracked, flaking at the base. ***Flowers*** White, with five petals, borne in clusters to 2½ in (6 cm) across, in late spring to early summer. ***Fruit*** A rounded, orange or yellow berry, ⅝ in (1.5 cm) across.

• **NATIVE REGION** S.W. China, Himalayas.

• **HABITAT** Evergreen and deciduous mountain forests.

• **REMARK** 'John Mitchell,' shown here, is the form seen most commonly.



Height 50 ft (15 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Sorbus* x *thuringiaca*	Author (Ilse) Fritsch

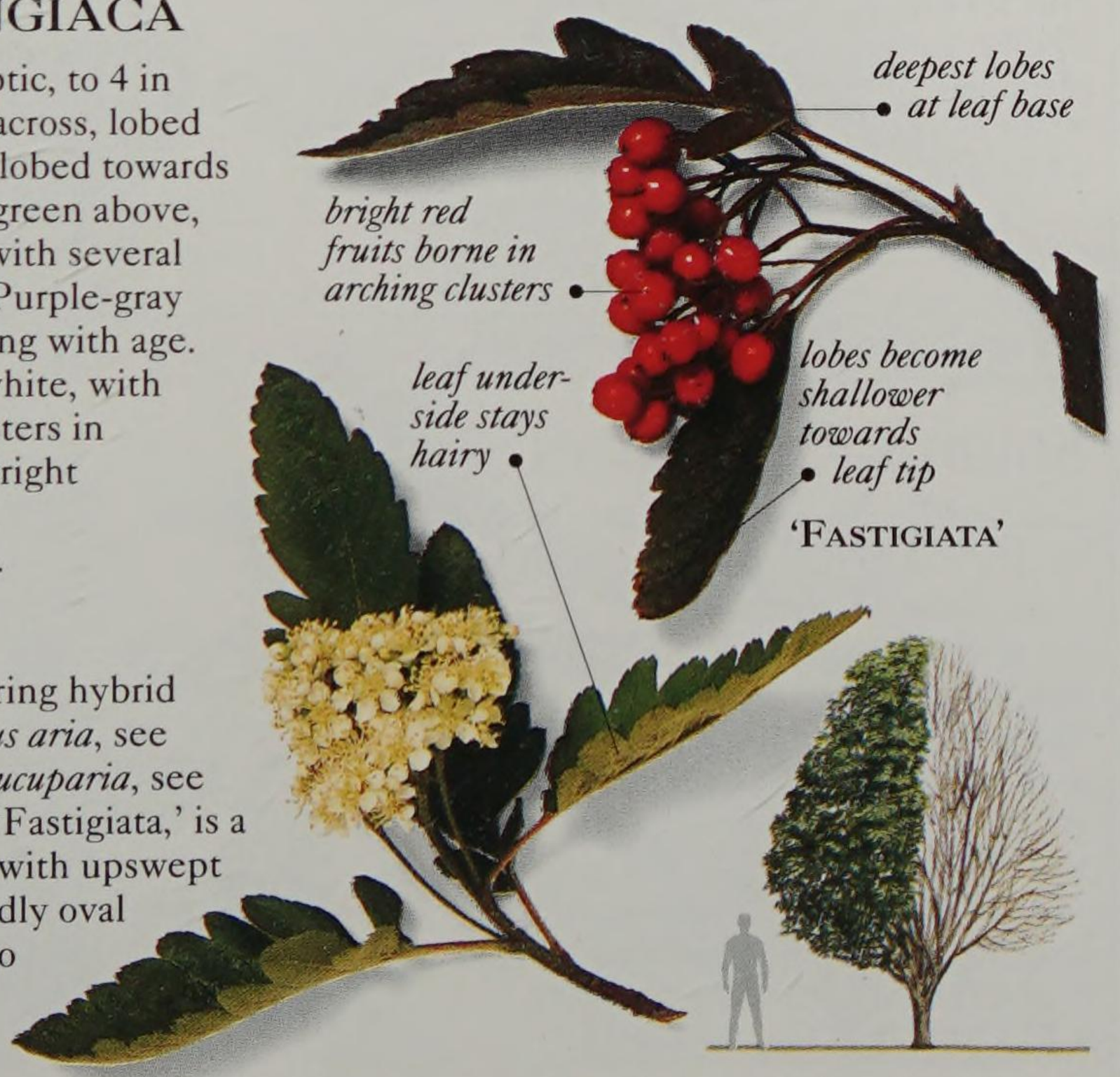
SORBUS X THURINGIACA

Leaves Narrowly ovate to elliptic, to 4 in (10 cm) long and 2½ in (6 cm) across, lobed except at the tip, more deeply lobed towards the base, toothed, glossy dark green above, gray and hairy beneath, often with several free leaflets at the base. ***Bark*** Purple-gray and smooth, cracking and flaking with age. ***Flowers*** ½ in (1.2 cm) across, white, with five petals, borne in dense clusters in late spring. ***Fruit*** A rounded, bright red berry, ⅜ in (1.2 cm) across.

• **NATIVE REGION** Europe.

• **HABITAT** Woods, together with the parent plants.

• **REMARK** A naturally occurring hybrid between the whitebeam *(Sorbus aria*, see p.274) and the rowan *(Sorbus aucuparia*, see p.275). The form shown here, 'Fastigiata,' is a commonly planted street tree, with upswept branches making a dense, broadly oval crown. Other forms are closer to *S. aucuparia*, and have more numerous free leaflets.



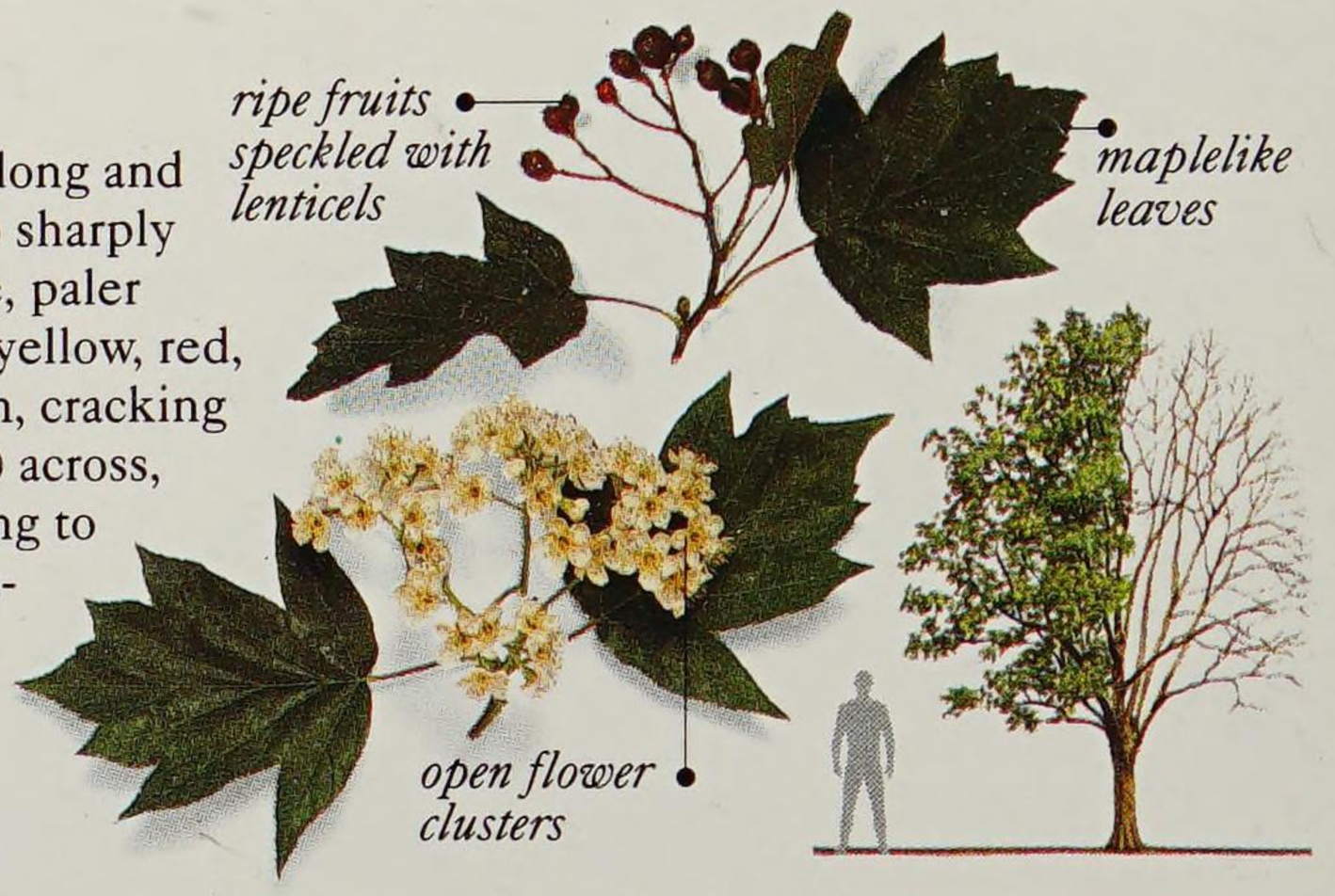
Height 40 ft (12 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Sorbus torminalis*	Author (Linnaeus) Crantz

WILD SERVICE TREE

Leaves Broadly ovate, to 4 in (10 cm) long and nearly the same across, deeply cut into sharply toothed lobes, glossy dark green above, paler beneath, downy when young, turning yellow, red, or purple in autumn. ***Bark*** Dark brown, cracking into scaly plates. ***Flowers*** ½ in (1.2 cm) across, white, in flattened clusters in late spring to early summer. ***Fruit*** A rounded, russet-brown berry, ½ in (1.2 cm) long.

• **NATIVE REGION** N. Africa, S.W. Asia, Europe.
• **HABITAT** Woods.



Height 50 ft (15 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Sorbus vestita*	Author (G. Don) Loddiges

SORBUS VESTITA

Leaves Elliptic, to 8 in (20 cm) or more long and 6 in (15 cm) across, sometimes with small lobes, sharply toothed, white-hairy when young becoming glossy dark green above, densely covered with white hairs beneath, with up to 11 pairs of veins. ***Bark*** Pale gray, peeling in thick flakes. ***Flowers*** ¾ in (2 cm) across, white, with five petals, in flattened clusters to 4 in (10 cm) across, in late spring to early summer. ***Fruit*** A rounded to pear-shaped berry, ¾ in (2 cm) across, green speckled with brown.

• **NATIVE REGION** The Himalayas.
• **HABITAT** Mountain forests.

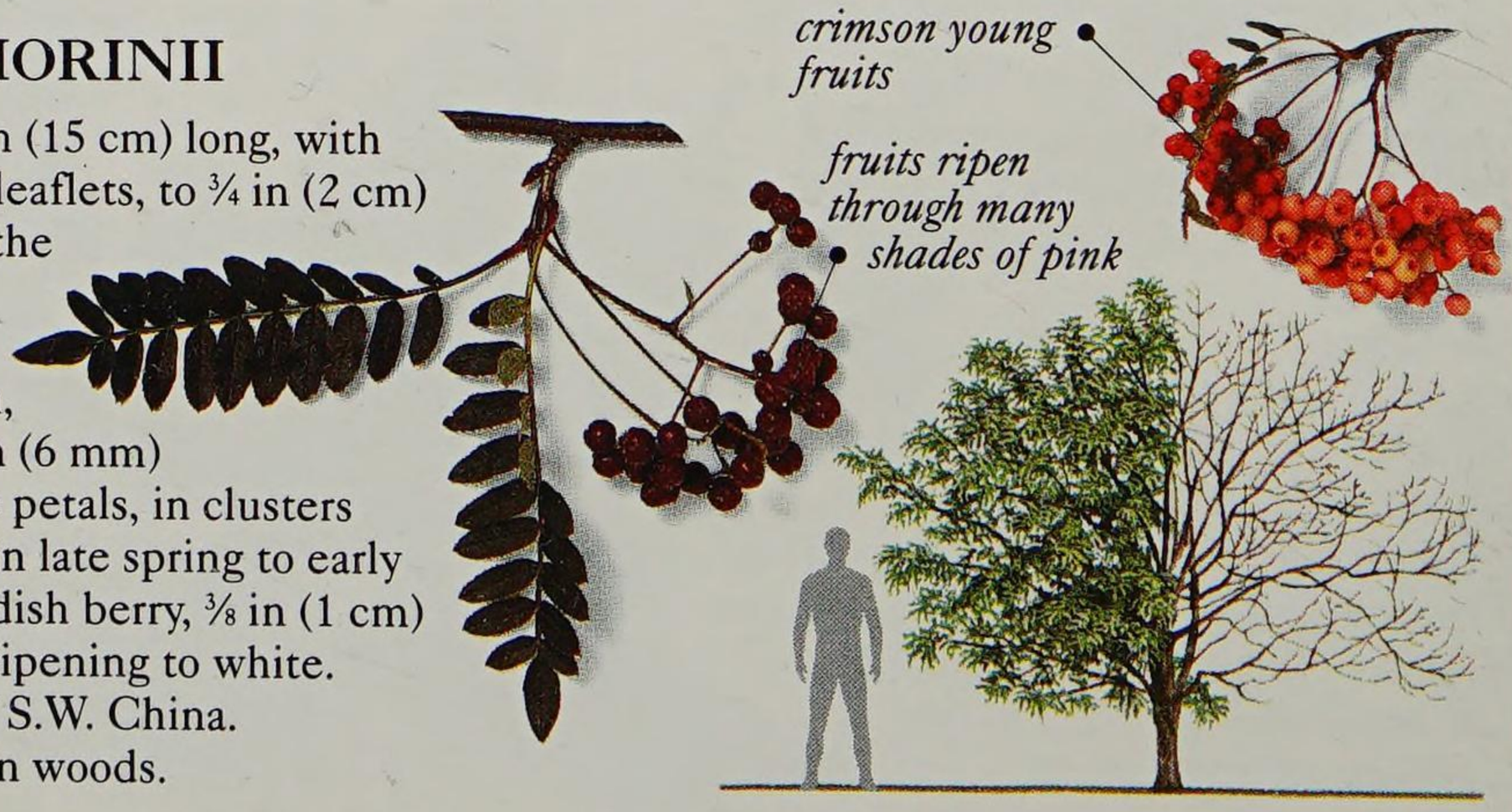
Height 50 ft (15 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family ROSACEAE	Species *Sorbus vilmorinii*	Author Schneider

SORBUS VILMORINII

Leaves Pinnate, to 6 in (15 cm) long, with up to about 25 oblong leaflets, to ¾ in (2 cm) long, toothed towards the tip, glossy dark green above, gray-green beneath. ***Bark*** Smooth, dark gray. ***Flowers*** ¼ in (6 mm) across, white, with five petals, in clusters to 4 in (10 cm) across, in late spring to early summer. ***Fruit*** A roundish berry, ⅜ in (1 cm) long, deep red at first ripening to white.

• **NATIVE REGION** S.W. China.
• **HABITAT** Mountain woods.



Height 26 ft (8 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

RUTACEAE

THE 1,500 SPECIES OF TREES, shrubs, and climbing plants belonging to this family are contained in over 150 genera. They are found worldwide, but particularly in tropical and warm temperate regions. The leaves are usually alternate and often compound, and release an aromatic vapor when crushed. Flowers are green to white or yellow, usually with four or five petals.

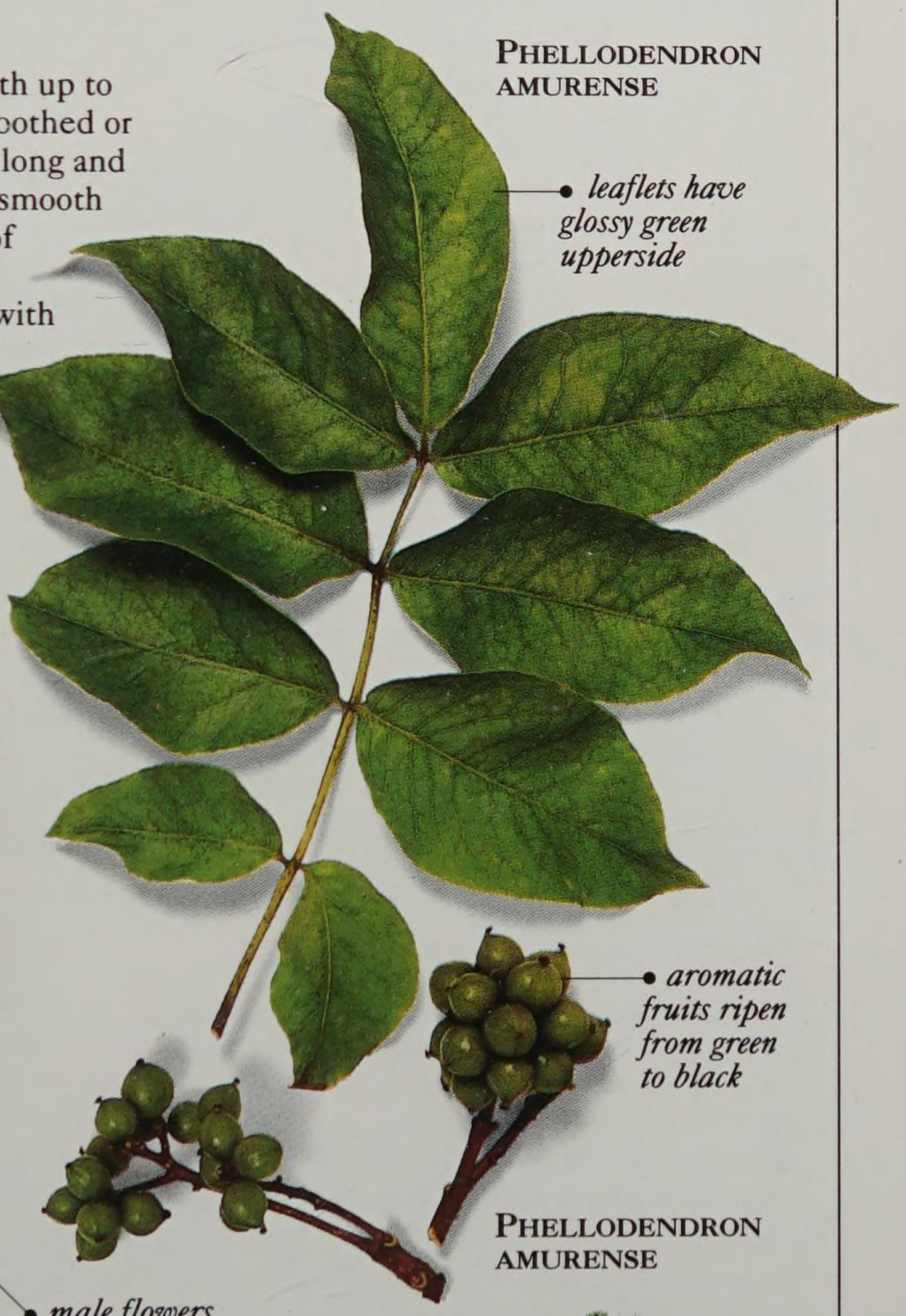
Family RUTACEAE	Species *Phellodendron amurense*	Author Ruprecht

AMUR CORK TREE

Leaves Pinnate, to 14 in (35 cm) long, with up to 13 ovate to lanceolate, taper-pointed, untoothed or minutely toothed leaflets, to 4 in (10 cm) long and 2 in (5 cm) across, glossy deep green and smooth above, blue-green with hairs at the base of the midrib beneath, turning yellow in autumn. ***Bark*** Gray-brown, thick, corky, with prominent ridges. ***Flowers*** Males and females both small and greenish, males with yellow, protruding anthers, borne in conical clusters about 3 in (7.5 cm) long, on separate plants in mid-summer. ***Fruit*** Rounded, ⅜ in (1 cm) across, green ripening to black.

• **NATIVE REGION** N.E. Asia.

• **HABITAT** Moist places near streams in mountains.



∇ VAR. LAVALLEI Smooth, rather less glossy, leaflets, with a gray-green, hairy-veined underside, distinguish this form.

Height 40 ft (12 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family RUTACEAE	Species *Ptelea trifoliata*	Author Linnaeus

HOP TREE

Leaves With three elliptic to ovate, untoothed or sparsely toothed leaflets, to 4 in (10 cm) long and 1½ in (4 cm) across, glossy dark green above, usually more or less smooth on both sides, turning yellow in autumn, aromatic when crushed. ***Bark*** Dark gray, nearly smooth. ***Flowers*** About ⅜ in (1 cm) across, yellow-green to green, with four or five petals, in clusters to 3 in (7.5 cm) across, at the ends of the shoots in early summer. ***Fruit*** With two seeds in the center of a broad, circular wing, to 1 in (2.5 cm) across, pale green ripening to pale brown.

• **NATIVE REGION**
E. North America.

• **HABITAT** Moist woods, thickets, and rocky slopes.

PTELEA TRIFOLIATA

◁ **'AUREA'**
Viewed as a mass of foliage, the yellow young leaves of this form are quite striking.

Height 26 ft (8 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family RUTACEAE	Species *Tetradium daniellii*	Author (Bennett) Hartley

TETRADIUM DANIELLII

Leaves Pinnate, to 12 in (30 cm) or more long, with up to 11 ovate or oblong, usually short-pointed, untoothed leaflets, to 4 in (10 cm) long and 1½ in (4 cm) across, glossy dark green and smooth above, blue-green and hairy at least when young beneath. ***Bark*** Gray and smooth. ***Flowers*** Small, white, aromatic, in broadly flattened heads to 6 in (15 cm) across, at the ends of the shoots in late summer to early autumn. ***Fruit*** A small, beaked, red-brown to nearly black capsule, 5⁄16 in (8 mm) long, in dense clusters.

• **NATIVE REGION**
China, Korea.

• **HABITAT** Mountain woods.

• **REMARK** Previously known as *Euodia daniellii*.

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

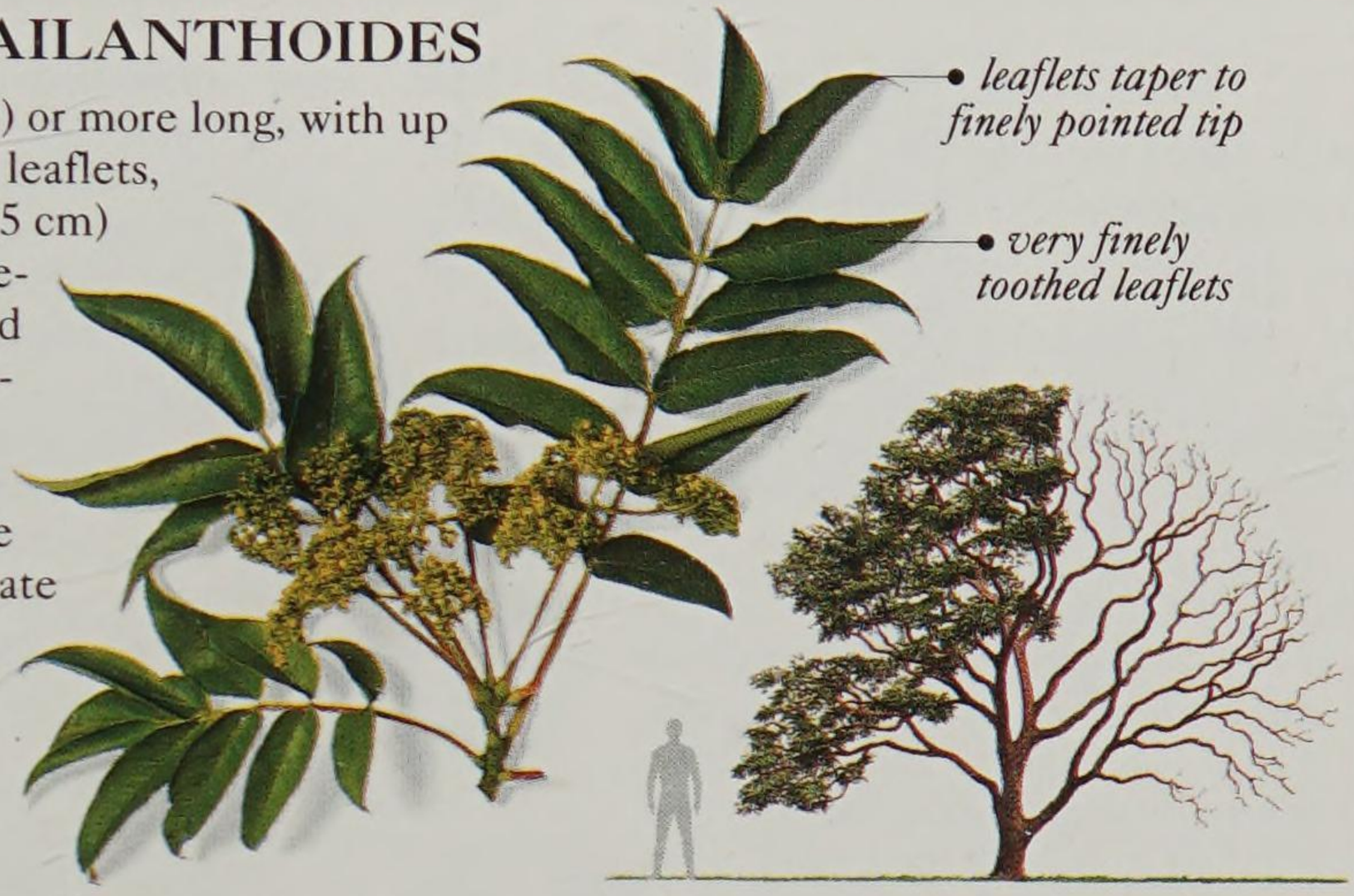
Family RUTACEAE	Species *Zanthoxylum ailanthoides*	Author Siebold & Zuccarini

ZANTHOXYLUM AILANTHOIDES

Leaves Pinnate, 12 in (30 cm) or more long, with up to 15 pairs of oblong, pointed leaflets, to 6 in (15 cm) long and 2 in (5 cm) across, light green above, blue-green beneath. ***Bark*** Gray and green, striped, with spiny protuberances. ***Flowers*** Males and females yellow-green, in broad heads at the ends of the shoots, on separate plants in late summer. ***Fruit*** Small, green, with black seeds.

• **NATIVE REGION** E. Asia.

• **HABITAT** Woods.



Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family RUTACEAE	Species *Zanthoxylum simulans*	Author Hance

ZANTHOXYLUM SIMULANS

Leaves Pinnate, to 8 in (20 cm) long, with up to 11 ovate, sparsely toothed leaflets, glossy green sometimes prickly above, usually with prickles beneath, the rachis slightly winged, aromatic when crushed, carried on prickly stalks. ***Bark*** Gray, with conical protuberances. ***Flowers*** Small and green, borne in clusters to 2 in (5 cm) across, in summer. ***Fruit*** Small, round, and warty, very aromatic, 3/16 in (5 mm) across, green ripening to red, drying and splitting open to release glossy black seeds.

• **NATIVE REGION** China.

• **HABITAT** Mountain woods and thickets.

• **REMARK** As the plant grows, spines on the trunk harden, developing into the rough, limpetlike swellings that characterize the bark of this species.

Height 20 ft (6 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

SALICACEAE

THE TWO GENERA and about 350 species of trees and shrubs in this family occur throughout the world, except in Australasia, most commonly in northern temperate regions. Leaves are alternate or occasionally opposite. The tiny, petalless flowers are borne in catkins, males and females nearly always on separate plants. The fruit is a capsule containing small seeds.

Family SALICACEAE	Species *Populus alba*	Author Linnaeus

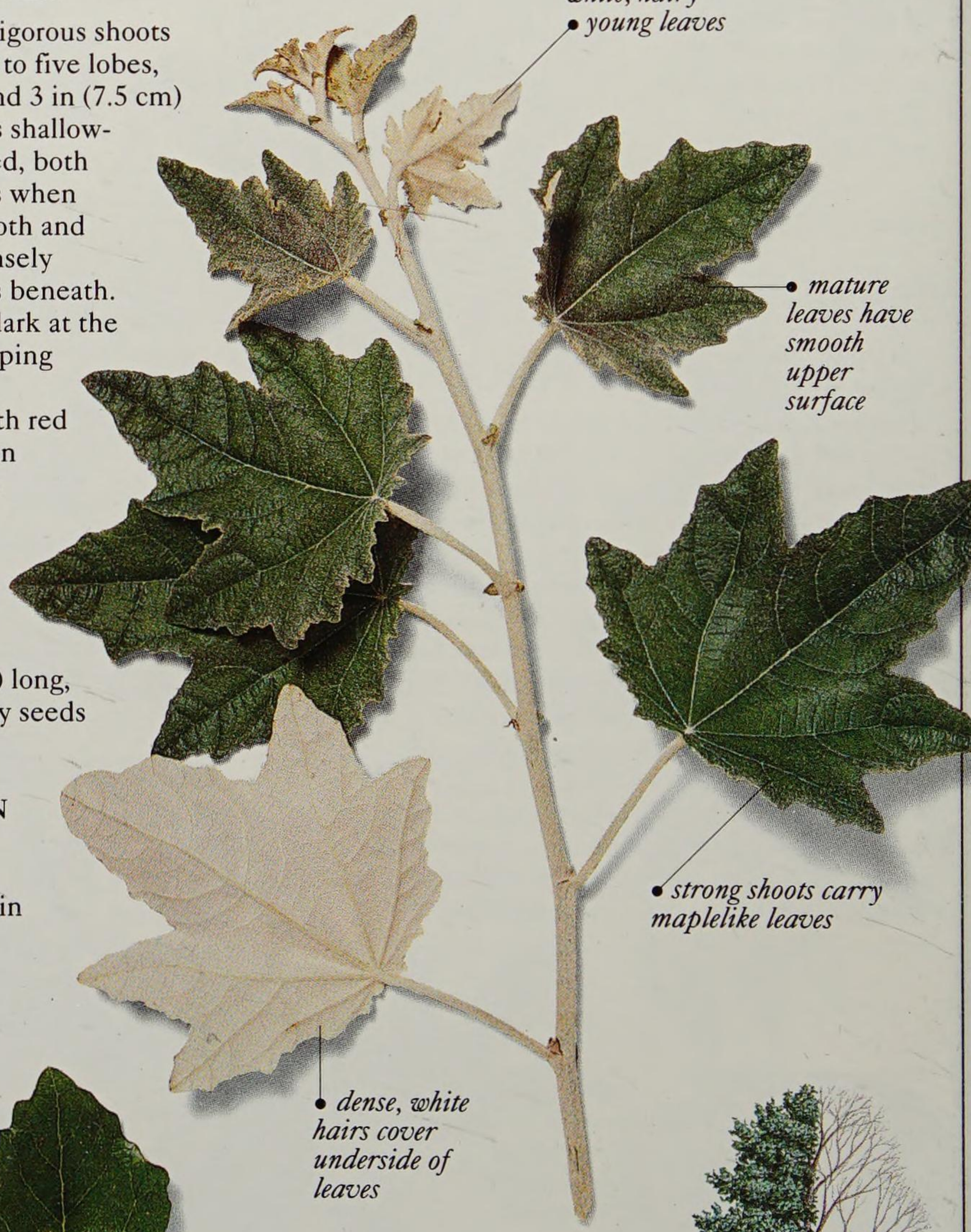
WHITE POPLAR

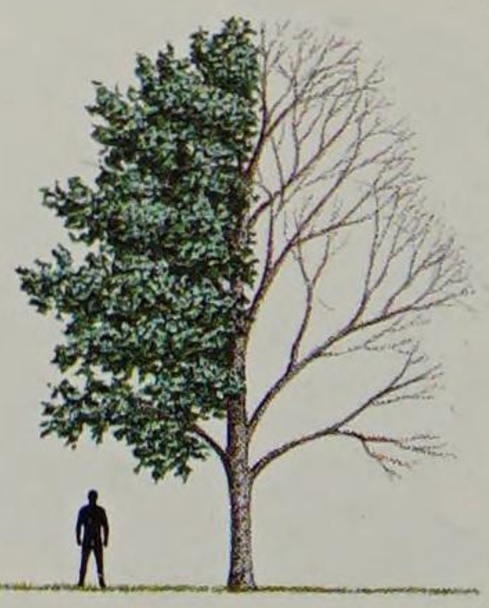
Leaves Variable, on vigorous shoots maplelike, with three to five lobes, to 4 in (10 cm) long and 3 in (7.5 cm) across, on short shoots shallowly lobed to wavy-edged, both types white with hairs when young becoming smooth and dark green above, densely covered in white hairs beneath. ***Bark*** Gray, fissured, dark at the base. ***Flowers*** In drooping catkins, males to 3 in (7.5 cm) long, gray with red anthers, females to 2 in (5 cm) long, green, on separate plants in early spring before the young leaves. ***Fruit*** Small, green capsules, borne in catkins to 4 in (10 cm) long, opening to release tiny seeds held in white, cotton wool-like hairs.

• **NATIVE REGION** N. Africa, C. and W. Asia, Europe.

• **HABITAT** Woods, in moist and dry places.

• **REMARK** Also known as abele.





Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

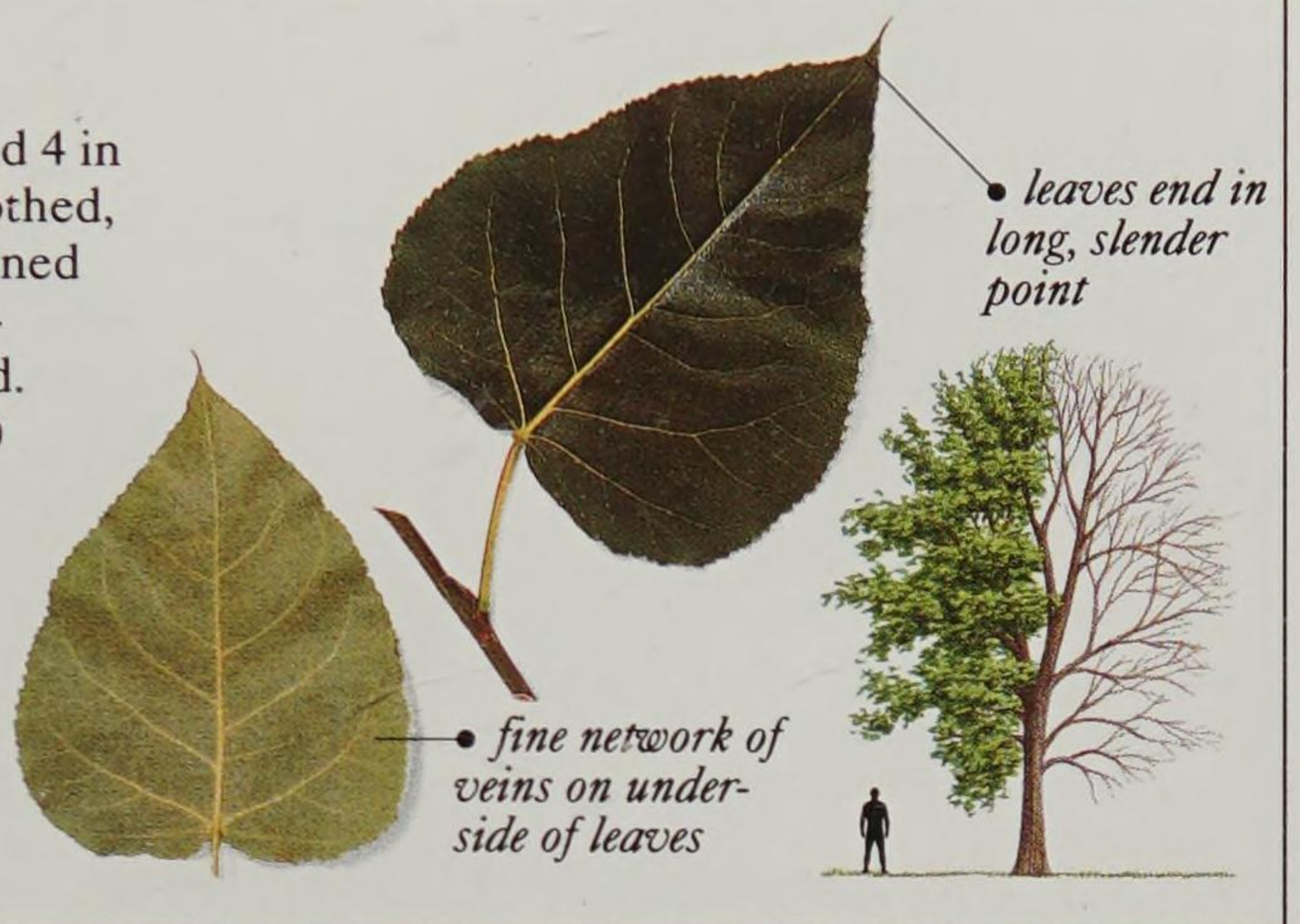
Family SALICACEAE	Species *Populus balsamifera*	Author Linnaeus

BALSAM POPLAR

Leaves Ovate, to 4¾ in (12 cm) long and 4 in (10 cm) across, taper-pointed, finely toothed, glossy green above, whitish and net-veined beneath, smooth on both sides, balsam-scented when young. ***Bark*** Gray, ridged. ***Flowers*** In catkins, males to 2 in (5 cm) long, females to 3 in (7.5 cm) long, green, on separate plants in early spring. ***Fruit*** Small green capsules, in catkins to 12 in (30 cm) long.

• **NATIVE REGION** North America.

• **HABITAT** Moist woods.



Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family SALICACEAE	Species *Populus* x *canadensis*	Author Moench

POPULUS X CANADENSIS

Leaves Broadly triangular, to 4 in (10 cm) long and across, with a short point at the tip, finely toothed, glossy green above. ***Bark*** Pale gray, with deep, vertical fissures. ***Flowers*** In catkins, males to 4 in (10 cm) long, females green, on separate plants in early spring before the leaves. ***Fruit*** Small green capsules, opening to release tiny seeds held in fluffy white hairs.

• **NATIVE REGION** Of garden origin.

• **REMARK** This group of hybrids between the North American species, cotton-wood *(Populus deltoides)*, and the black poplar *(Populus nigra,* see p.289), has many forms, including some of the most commonly grown poplars.

'MARILANDICA' ▷
Deep furrows give the bark of this form a craggy appearance.

◁ 'ROBUSTA'
The bronze-red young leaves of this male form emerge in mid-spring, and mature by late summer to glossy deep green.

Δ 'SEROTINA AUREA'
This male form, which has bright yellow summer foliage, comes into leaf in late spring.

Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

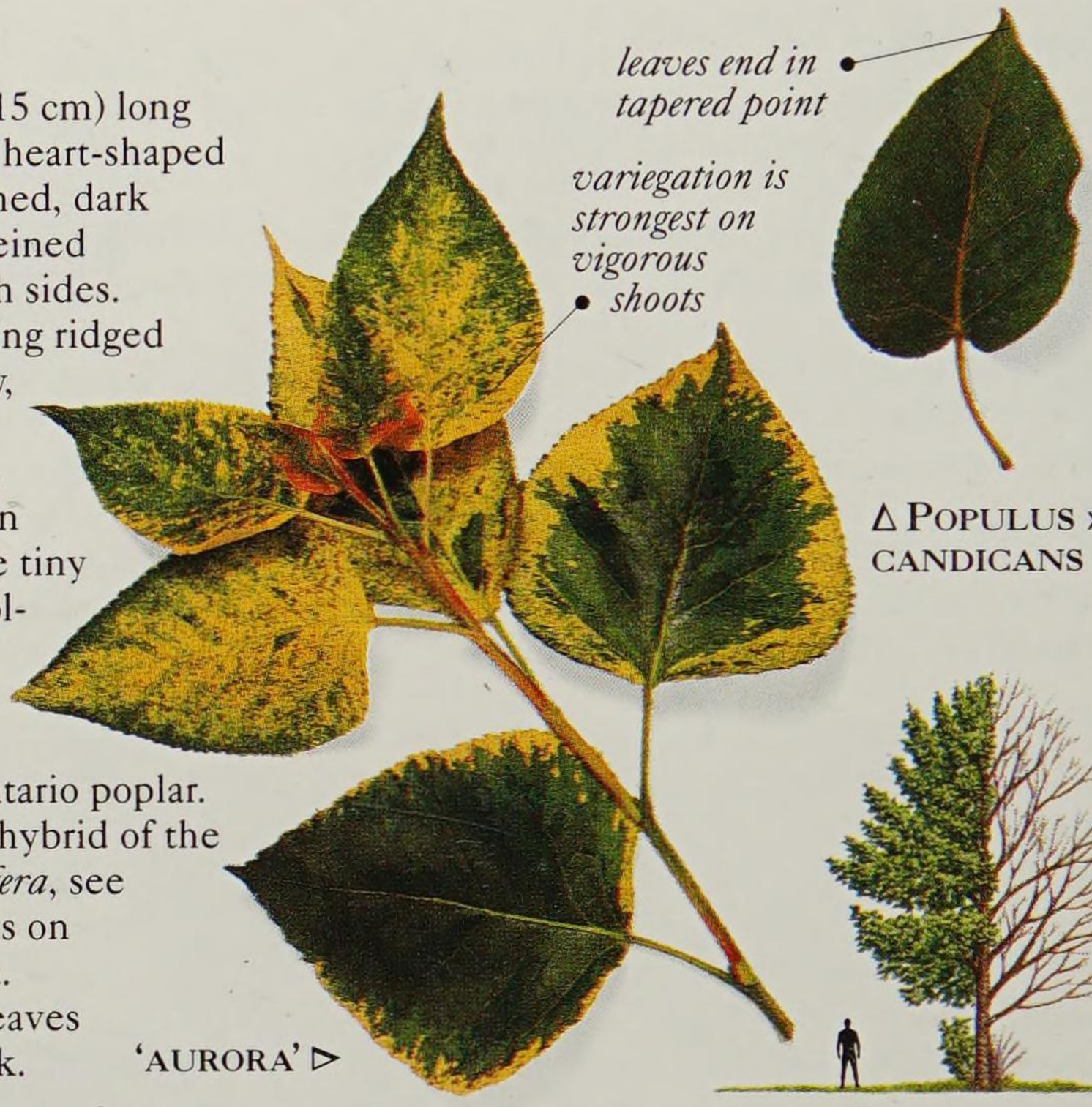
Family SALICACEAE	Species *Populus* x *candicans*	Author Aiton

BALM OF GILEAD

Leaves Broadly ovate, to 6 in (15 cm) long and 4 in (10 cm) across, usually heart-shaped at the base, taper-pointed, toothed, dark green above, whitish and net-veined beneath, slightly downy on both sides. ***Bark*** Gray and smooth, becoming ridged with age. ***Flowers*** Females only, green, in drooping catkins in early spring. ***Fruit*** Small, green capsules, borne in catkins to 6 in (15 cm) long, opening to release tiny seeds held in white, cotton wool-like hairs.

• **NATIVE REGION**
Of garden origin.

• **REMARK** Also known as Ontario poplar. This species is thought to be a hybrid of the balsam poplar *(Populus balsamifera*, see p.287), naturalized from gardens on riverbanks in E. North America. 'Aurora,' a common form, has leaves blotched white, cream, and pink.



Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family SALICACEAE	Species *Populus* x *canescens*	Author (Aiton) P. Smith

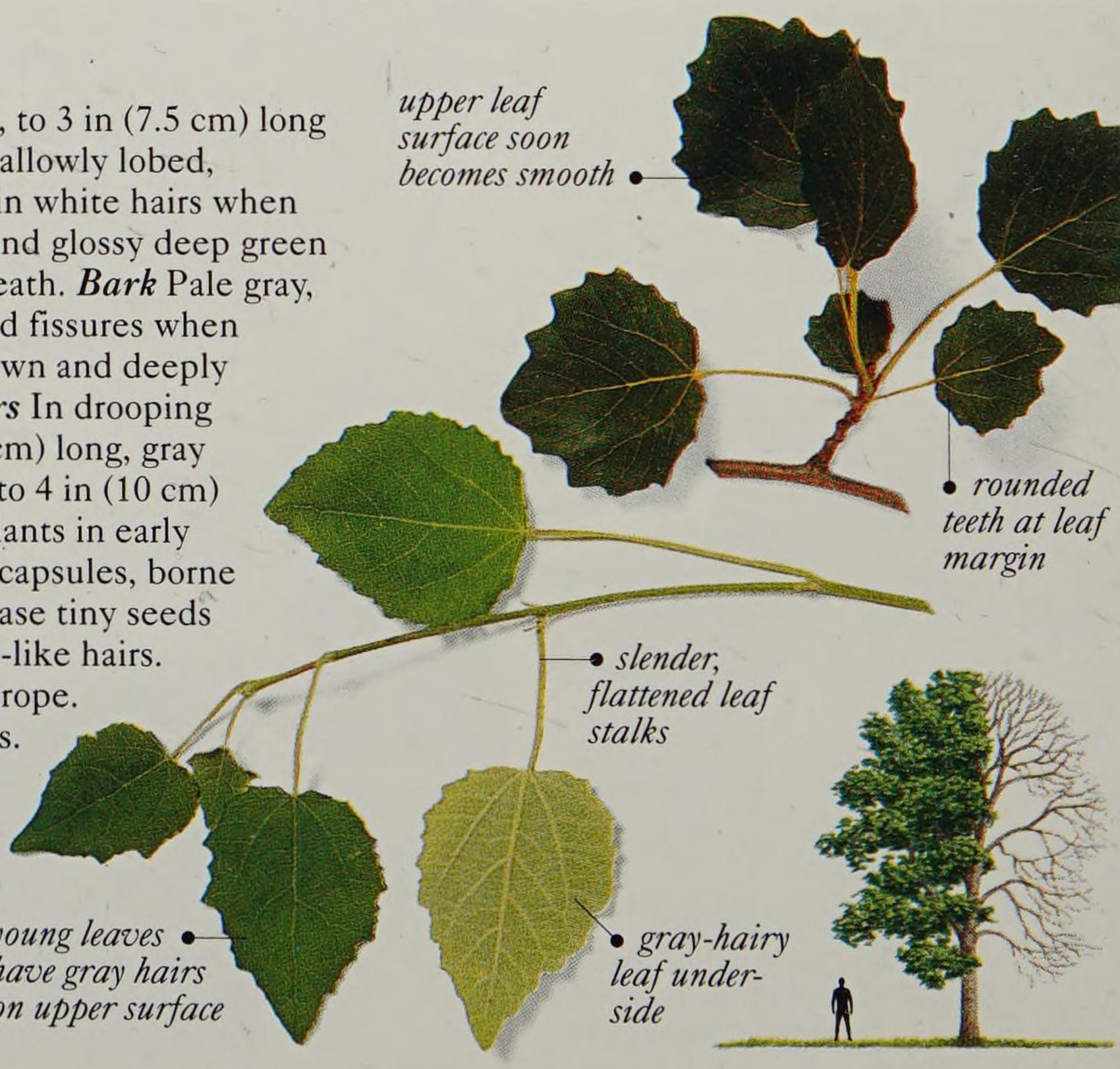
GRAY POPLAR

Leaves Rounded to ovate, to 3 in (7.5 cm) long and across, occasionally shallowly lobed, toothed, densely covered in white hairs when young becoming smooth and glossy deep green above, gray and hairy beneath. ***Bark*** Pale gray, with dark, diamond-shaped fissures when young, becoming dark brown and deeply furrowed with age. ***Flowers*** In drooping catkins, males to 4 in (10 cm) long, gray with red anthers, females to 4 in (10 cm) long, green, on separate plants in early spring. ***Fruit*** Small green capsules, borne in catkins, opening to release tiny seeds held in white, cotton wool-like hairs.

• **NATIVE REGION** Europe.

• **HABITAT** River valleys.

• **REMARK** A hybrid between the white poplar *(Populus alba*, see p.286) and the aspen *(Populus tremula*, see p.290), widely naturalized from cultivation.



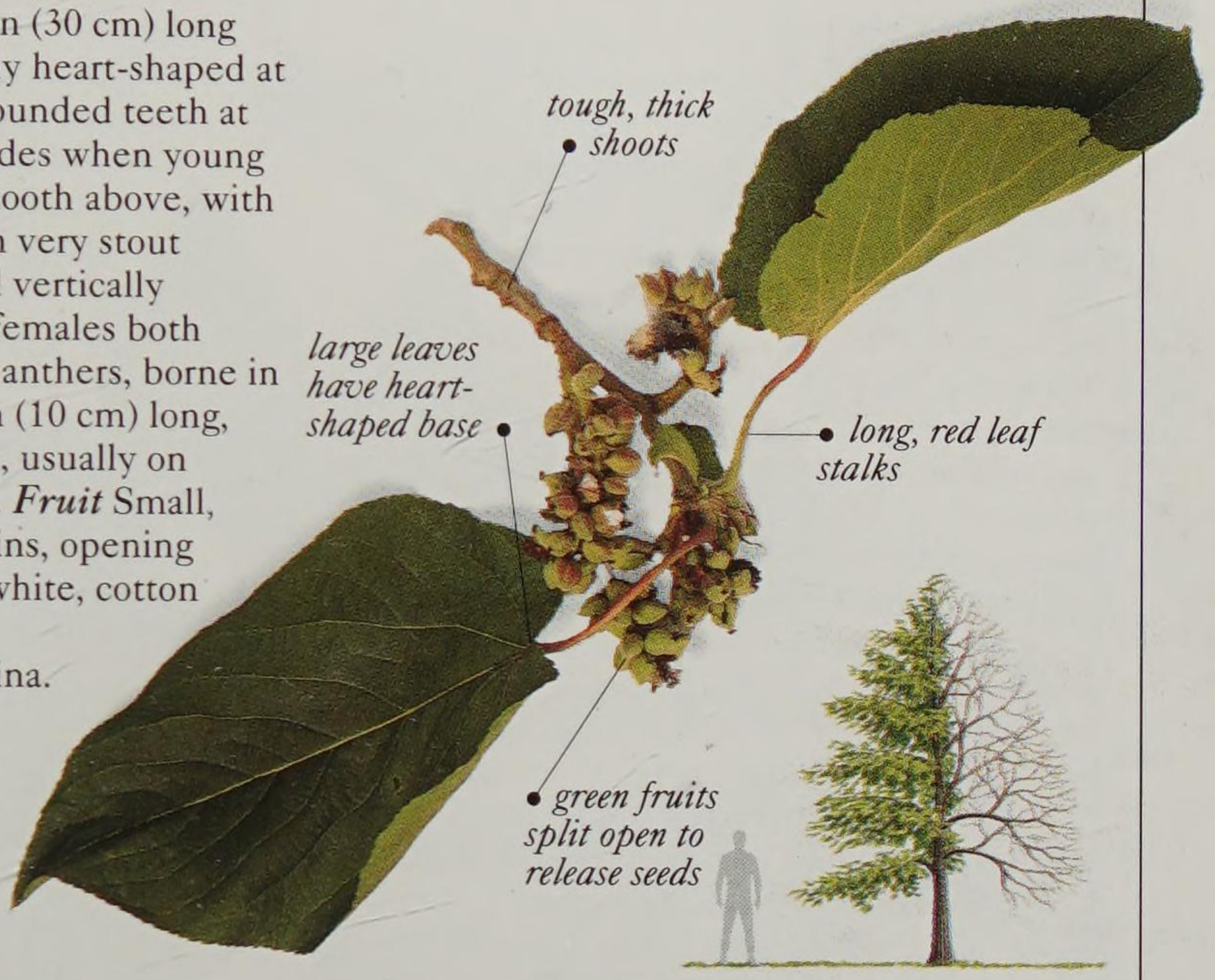
Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family SALICACEAE	Species *Populus lasiocarpa*	Author Oliver

CHINESE POPLAR

Leaves Broadly ovate, to 12 in (30 cm) long and 8 in (20 cm) across, deeply heart-shaped at the base, edged with small, rounded teeth at the margin, downy on both sides when young becoming deep green and smooth above, with red veins and stalk, carried on very stout shoots. ***Bark*** Gray-brown and vertically fissured. ***Flowers*** Males and females both yellow-green, males with red anthers, borne in stout, drooping catkins to 4 in (10 cm) long, sometimes on the same spike, usually on separate plants in mid-spring. ***Fruit*** Small, green capsules, borne in catkins, opening to release tiny seeds held in white, cotton wool-like hairs.

• **NATIVE REGION** C. China.
• **HABITAT** Moist woods in mountains.
• **REMARK** The very large, long-stalked leaves easily distinguish this species from others of its genus.



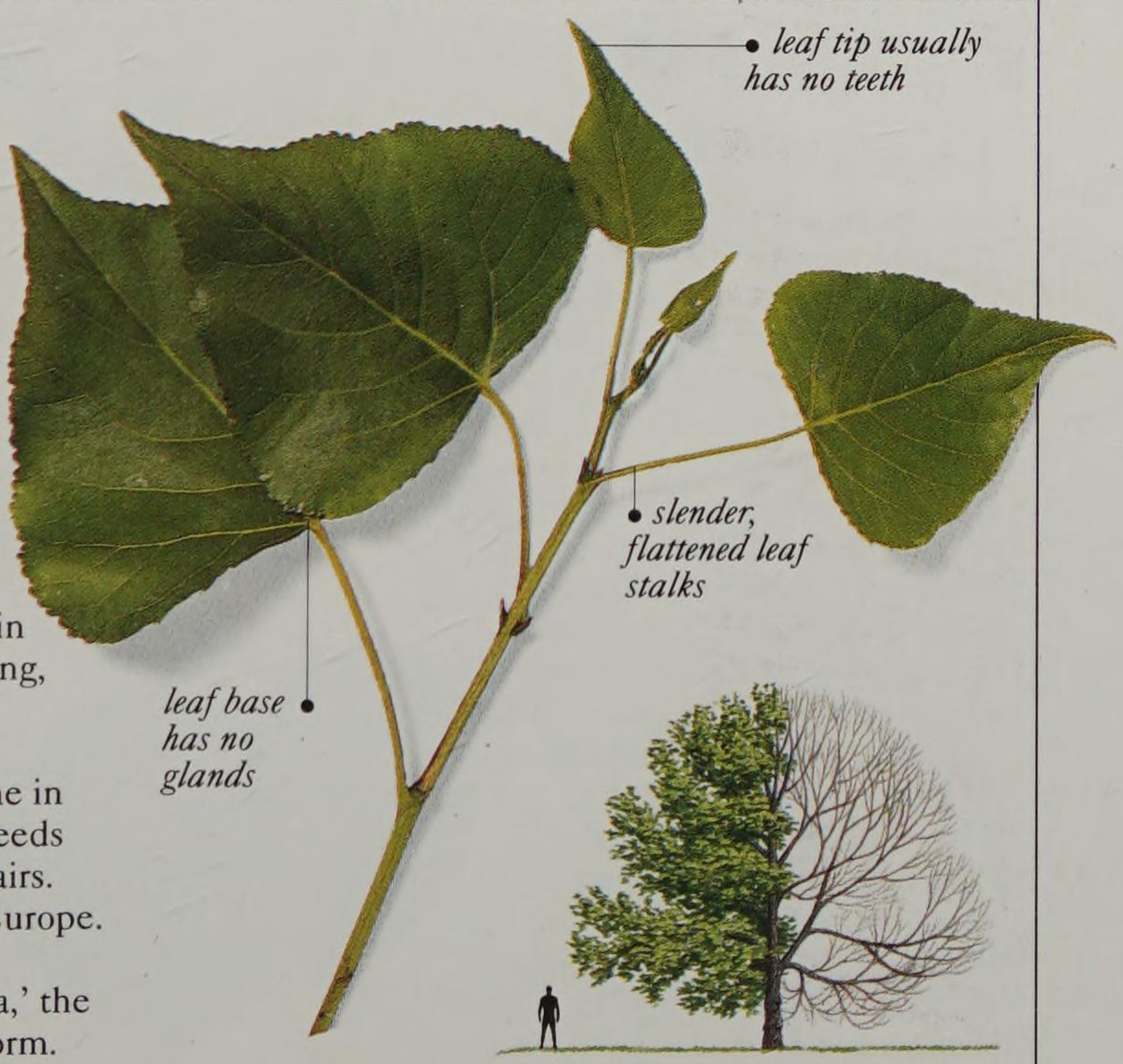
Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family SALICACEAE	Species *Populus nigra*	Author Linnaeus

BLACK POPLAR

Leaves Triangular to ovate, to 4 in (10 cm) long and nearly the same across, larger on vigorous shoots, taper-pointed at the tip, bluntly toothed, with a narrow, translucent margin, bronze becoming glossy dark green above, paler beneath, smooth on both sides, turning yellow in autumn. ***Bark*** Dark gray-brown, coarsely fissured, often with large burrs. ***Flowers*** Males with red anthers, females green, in drooping catkins to 2 in (5 cm) long, on separate plants in early spring before the young leaves emerge. ***Fruit*** Small, green capsules, borne in catkins, opening to release tiny seeds held in white, cotton wool-like hairs.

• **NATIVE REGION** W. Asia, Europe.
• **HABITAT** River valleys.
• **REMARK** *Populus nigra* 'Italica,' the Lombardy poplar, is an upright form.



Height 100 ft (30 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family SALICACEAE	Species *Populus szechuanica*	Author Schneider

POPULUS SZECHUANICA

Leaves Ovate, to 12 in (30 cm) long and 8 in (20 cm) or more across on vigorous shoots, usually much smaller on short shoots, rounded to heart-shaped at the base, tapered at the tip, blunt-toothed, reddish to bronze-colored when young becoming dark green above, paler beneath, smooth on both sides. ***Bark*** Pinkish gray, cracking into large, smooth flakes with age. ***Flowers*** Small and without petals, males with deep red anthers, females green, borne in drooping catkins on separate plants in mid-spring before the young leaves emerge. ***Fruit*** Small, green capsules, in catkins to 6¼ in (16 cm) long, opening to release tiny seeds held in white, cotton wool-like hairs.

- **NATIVE REGION** W. China.
- **HABITAT** Moist mountain woods.
- **REMARK** The leaves of the form shown here, var. *thibetica*, are slightly hairy on the underside.

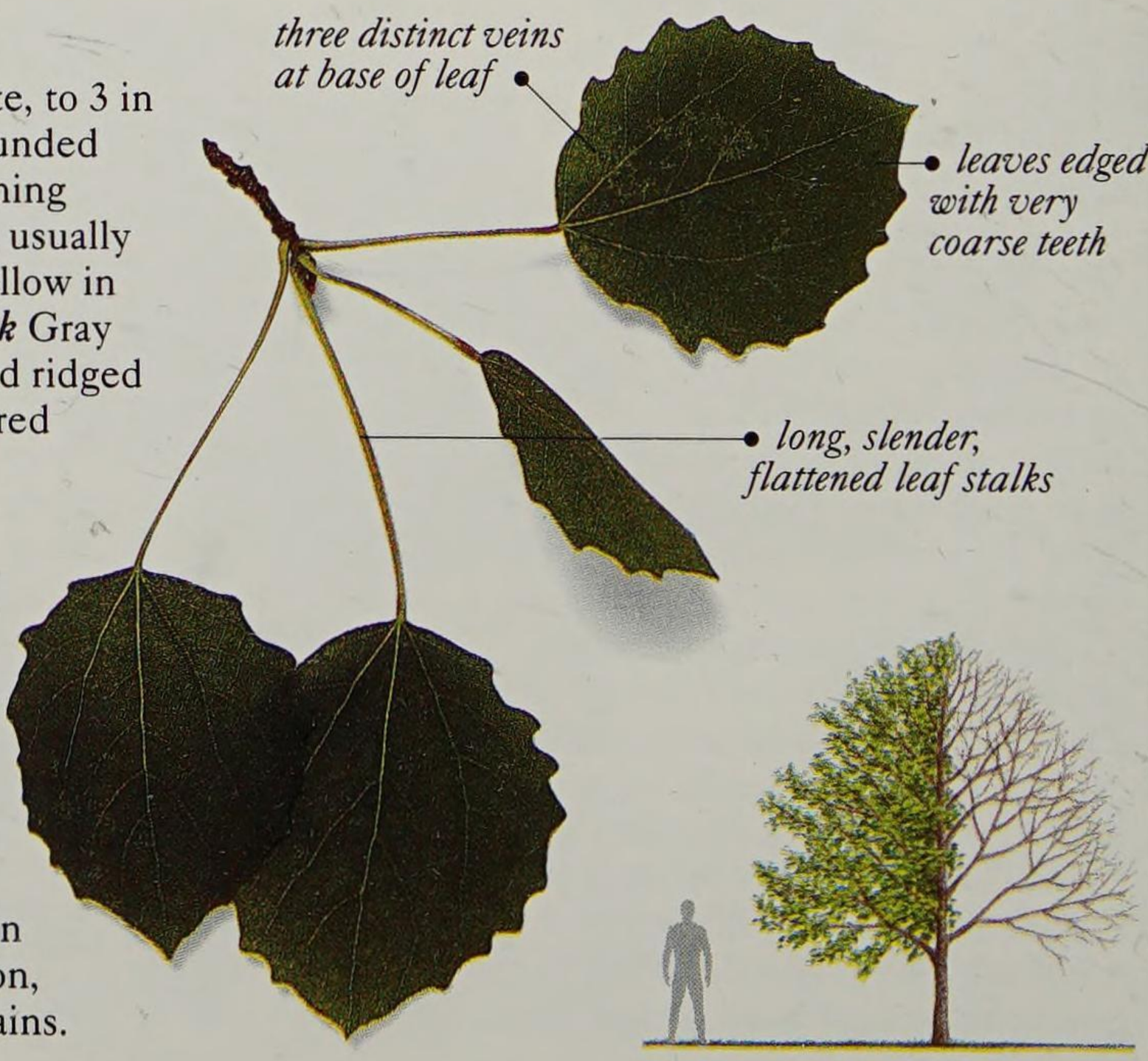
Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family SALICACEAE	Species *Populus tremula*	Author Linnaeus

EUROPEAN ASPEN

Leaves Rounded to broadly ovate, to 3 in (7.5 cm) long and across, with rounded teeth, bronze when young becoming gray-green above, paler beneath, usually smooth on both sides, turning yellow in autumn, on flattened stalks. ***Bark*** Gray and smooth, becoming darker and ridged at the base. ***Flowers*** Males with red anthers, females green, borne in drooping catkins to 3 in (7.5 cm) long, on separate plants in early spring before the young leaves emerge. ***Fruit*** Small, green capsules, in catkins, opening to release tiny seeds held in white, cotton wool-like hairs.

- **NATIVE REGION** Asia, N. Africa, Europe.
- **HABITAT** Woods and scrub on poor soil. In the south of its region, this species occurs in the mountains.



Height 65 ft (20 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family SALICACEAE	Species *Salix alba*	Author Linnaeus

WHITE WILLOW

Leaves Lanceolate, to 4 in (10 cm) long and ⅝ in (1.5 cm) across, tapered at both ends, more slender at the tip, silvery-hairy when young becoming green above, gray or blue-green beneath. ***Bark*** Gray-brown, deeply fissured. ***Flowers*** Males and females both very small and without petals, clustered in slender, cylindrical, spreading to nearly upright catkins, males to 2 in (5 cm) long, yellow, females to 1½ in (4 cm) long, on separate plants in spring as the young leaves emerge. ***Fruit*** A small, green capsule, 3/16 in (5 mm) long, opening to release fluffy, white seeds.

• **NATIVE REGION** W. Asia, Europe.

• **HABITAT** Riversides and meadows by water.

• **REMARK** This species is widely cultivated in its native region, where it is planted particularly in moist, coastal areas and by rivers.

male catkins have yellow anthers

green female catkins

SALIX ALBA

visibly hairy, silvery young foliage

leaves taper to fine point

dark green mature foliage

leaf buds on bare winter shoot

blue-gray, slightly glaucous leaves

'BRITZENSIS' Δ
The young shoots of this form, which is commonly known as the scarlet willow, are bright orange-red during the winter months.

VAR. CAERULEA ▷
Cricket bats are traditionally made from this wood, hence the common name in Britian, cricket-bat willow.

Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family SALICACEAE	Species *Salix babylonica*	Author Linnaeus

CHINESE OR WEEPING WILLOW

Leaves Lanceolate, to 4 in (10 cm) long and ¾ in (2 cm) across, tapering to a long, slender point, finely toothed at the margin, green above, bluish green and hairy when young becoming smooth beneath, on hanging, glossy brown shoots. ***Bark*** Gray-brown, fissured into rough, vertical ridges. ***Flowers*** Very small, without petals, borne in slender, cylindrical catkins, males to 2 in (5 cm) long, yellow, females to 1 in (2.5 cm) long, green, on separate plants in spring with the young leaves. ***Fruit*** A small green capsule, 3/16 in (5 mm) long, opening to release fluffy, white seeds.

• **NATIVE REGION** N. China.

• **HABITAT** Now known only in cultivation.

• **REMARK** This species has been so long cultivated in North Africa, W. Asia, and E. Europe, that its original habitat cannot be determined.

male flowers, with yellow anthers, borne in catkins

◁ **SALIX BABYLONICA**

long, slender, drooping shoots

young leaves emerge with flowers

∇ **VAR. PEKINENSIS**
This form is also known as *Salix matsudana* and Pekin willow. It has a narrowly upright habit.

green female flowers, clustered in catkins

∇ **'PENDULA'**
This particularly graceful form of the weeping willow has typically long, drooping shoots and denser foliage.

finely taper-pointed, drooping leaves

visibly twisted shoots and leaves

'TORTUOSA' ▷
Commonly known as dragon's claw willow, this form has curiously contorted shoots and leaves.

Height 40 ft (12 m)	Shape Broadly weeping	Leaf persistence Deciduous	Leaf type

Family SALICACEAE	Species *Salix daphnoides*	Author Villars

VIOLET WILLOW

Leaves Narrowly elliptic, to 4¾ in (12 cm) long and 1¼ in (3 cm) across, taper-pointed, shallowly toothed, glossy dark green above, blue-green beneath, hairy becoming smooth on both sides, the shoots normally bloomy becoming glossy red-brown. ***Bark*** Gray and smooth. ***Flowers*** Males and females both very small and without petals, males with yellow anthers, borne in silky-hairy catkins to 1½ in (4 cm) long, in late winter to early spring before the leaves emerge. ***Fruit*** A small, green capsule, 3/16 in (5 mm) long, opening to release fluffy, white seeds.

- **NATIVE REGION** Europe.
- **HABITAT** Moist woods.

Height 33 ft (10 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

Family SALICACEAE	Species *Salix fragilis*	Author Linnaeus

CRACK WILLOW

Leaves Lanceolate, to 6 in (15 cm) long and 1¼ in (3 cm) across, tapered to a fine point at the tip, finely toothed, silky-hairy when young becoming glossy dark green above, blue-green beneath, smooth on both sides. ***Bark*** Dark gray, deeply fissured. ***Flowers*** Males and females both very small and without petals, males yellow, females green, in cylindrical, slender catkins to 2½ in (6 cm) long, on separate plants in spring at the same time as the young leaves emerge. ***Fruit*** A small, green capsule, ⅛ in (3 mm) long, opening to release fluffy, white seeds.

- **NATIVE REGION** Asia, Europe.
- **HABITAT** Riversides.
- **REMARK** The twigs snap easily from the branches, giving rise to both the scientific and the common name.

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

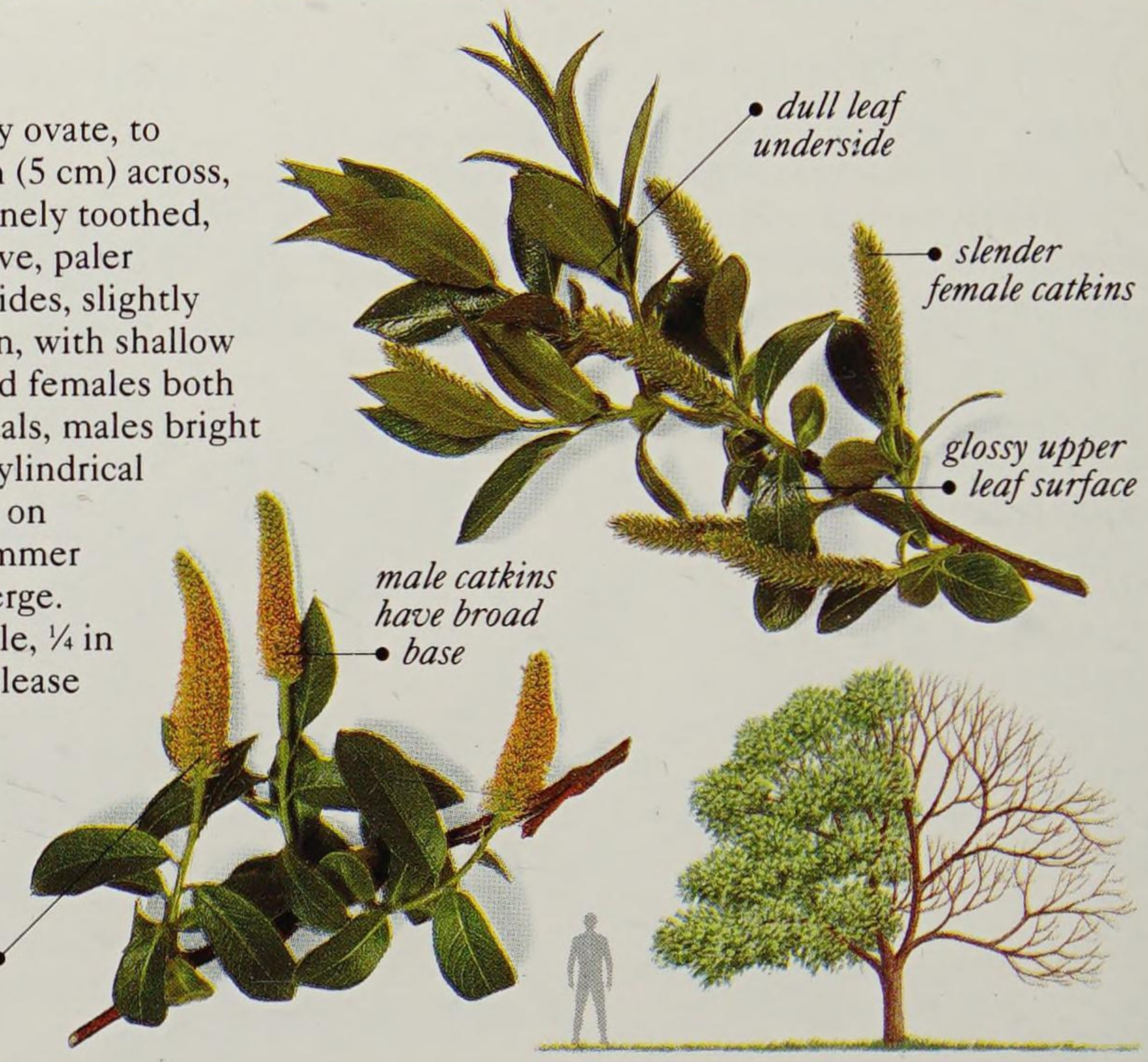
Family SALICACEAE	Species *Salix pentandra*	Author Linnaeus

BAY WILLOW

Leaves Elliptic to narrowly ovate, to 4¾ in (12 cm) long and 2 in (5 cm) across, tapering to a short point, finely toothed, glossy very dark green above, paler beneath, smooth on both sides, slightly aromatic. ***Bark*** Gray-brown, with shallow fissures. ***Flowers*** Males and females both very small and without petals, males bright yellow, females green, in cylindrical catkins to 2 in (5 cm) long, on separate plants in early summer after the young leaves emerge. ***Fruit*** A small, green capsule, ¼ in (6 mm) long, opening to release fluffy, white seeds.

• **NATIVE REGION** Asia, Europe.

• **HABITAT** Riverbanks and meadows.



Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

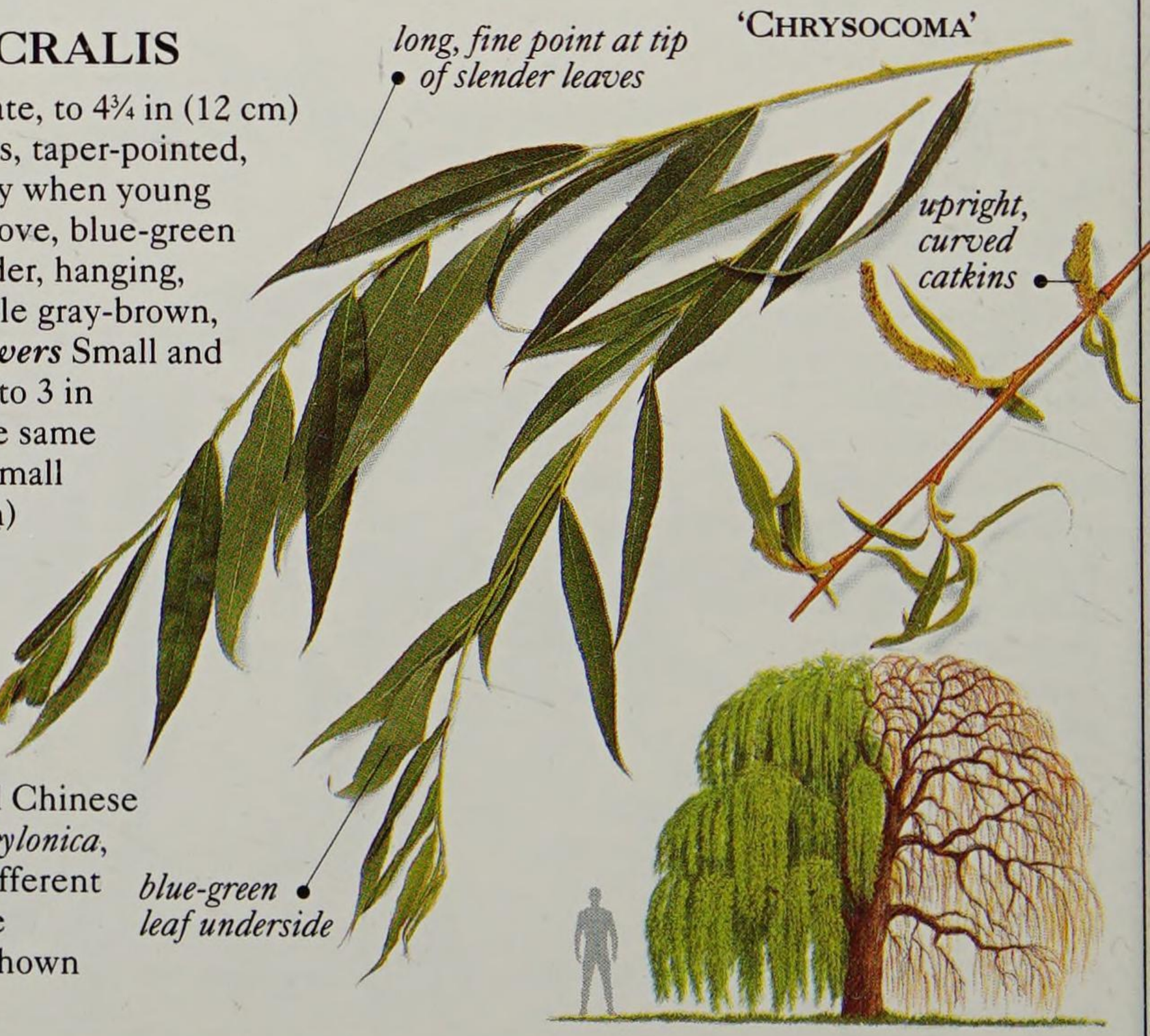
Family SALICACEAE	Species *Salix* x *sepulcralis*	Author Simonkai

SALIX X SEPULCRALIS

Leaves Narrowly lanceolate, to 4¾ in (12 cm) long and ¾ in (2 cm) across, taper-pointed, finely toothed, thinly hairy when young becoming bright green above, blue-green beneath, smooth, on slender, hanging, yellowish shoots. ***Bark*** Pale gray-brown, with shallow fissures. ***Flowers*** Small and without petals, in catkins to 3 in (7.5 cm) long, often on the same spike, in spring. ***Fruit*** A small green capsule, ⅛ in (3 mm) long, opening to release fluffy, white seeds.

• **NATIVE REGION** Of garden origin.

• **REMARK** A hybrid between white willow *(Salix alba*, see p.291) and Chinese weeping willow *(Salix babylonica*, see p.292). Of its many different forms, 'Chrysocoma' – the familiar weeping willow shown here – is the best-known.



Height 65 ft (20 m)	Shape Broadly weeping	Leaf persistence Deciduous	Leaf type

SAPINDACEAE

WIDELY DISTRIBUTED MAINLY in tropical and subtropical regions, this family has 1,500 or so species of deciduous trees, shrubs, and climbers, collected in about 150 genera. The leaves are alternate, simple, pinnate, bipinnate, or with three leaflets. The small male or female flowers have usually five petals. The fruit is a dry and winged capsule, nut, or berry.

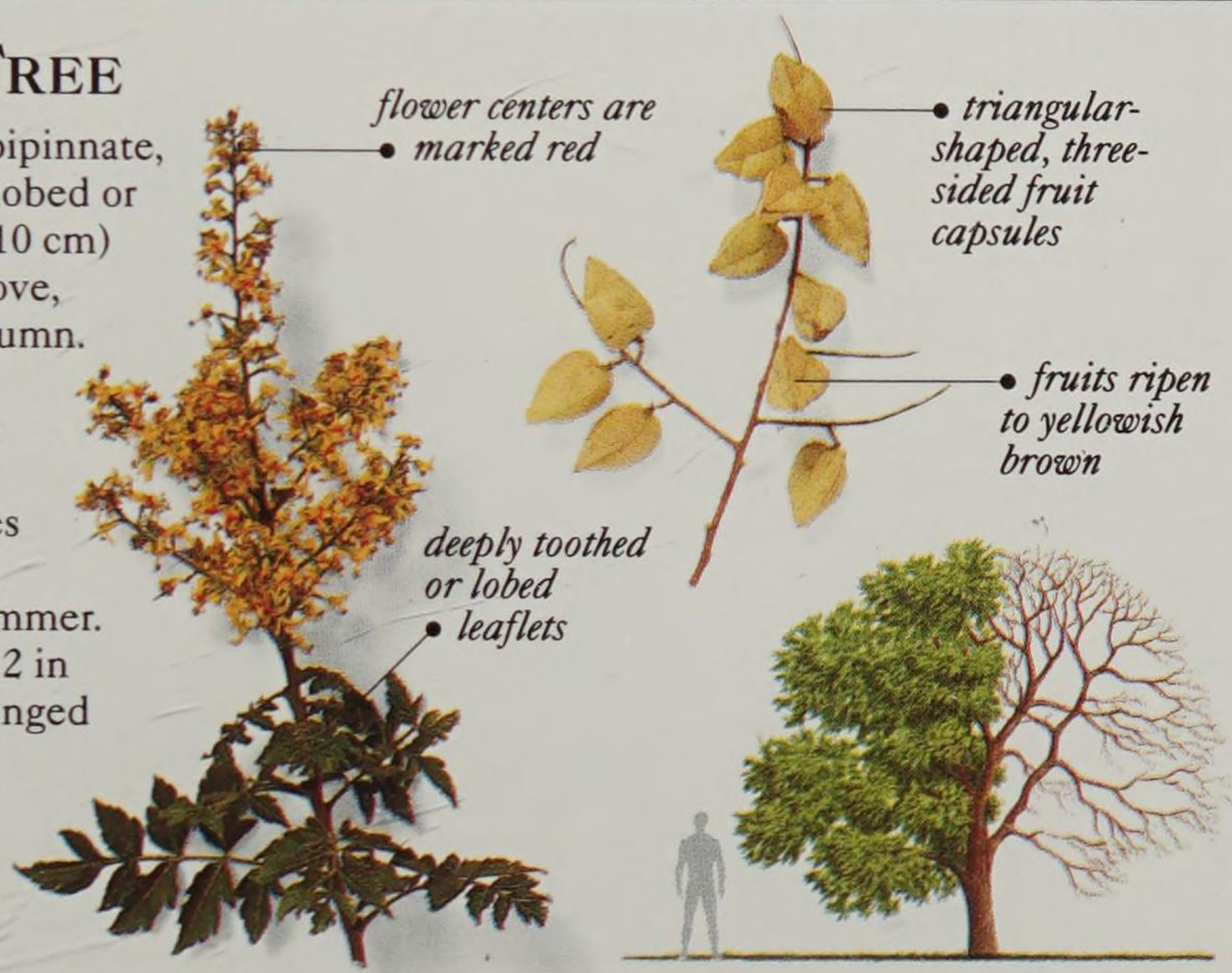
Family SAPINDACEAE	Species *Koelreuteria paniculata*	Author Laxmann

GOLDEN RAIN TREE

Leaves Pinnate or partially bipinnate, to 18 in (45 cm) long, either lobed or divided into leaflets to 4 in (10 cm) long, toothed, dark green above, downy, turning yellow in autumn. ***Bark*** Pale brown, shallowly fissured. ***Flowers*** About ½ in (1.2 cm) across, yellow, with four petals, in conical panicles to 18 in (45 cm) long, at the shoot ends in mid- to late summer. ***Fruit*** Bladderlike capsule to 2 in (5 cm) long, green or green tinged red ripening to pale brown.

• **NATIVE REGION** China, Korea.

• **HABITAT** Hot, dry, river valleys.



Height 40 ft (12 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

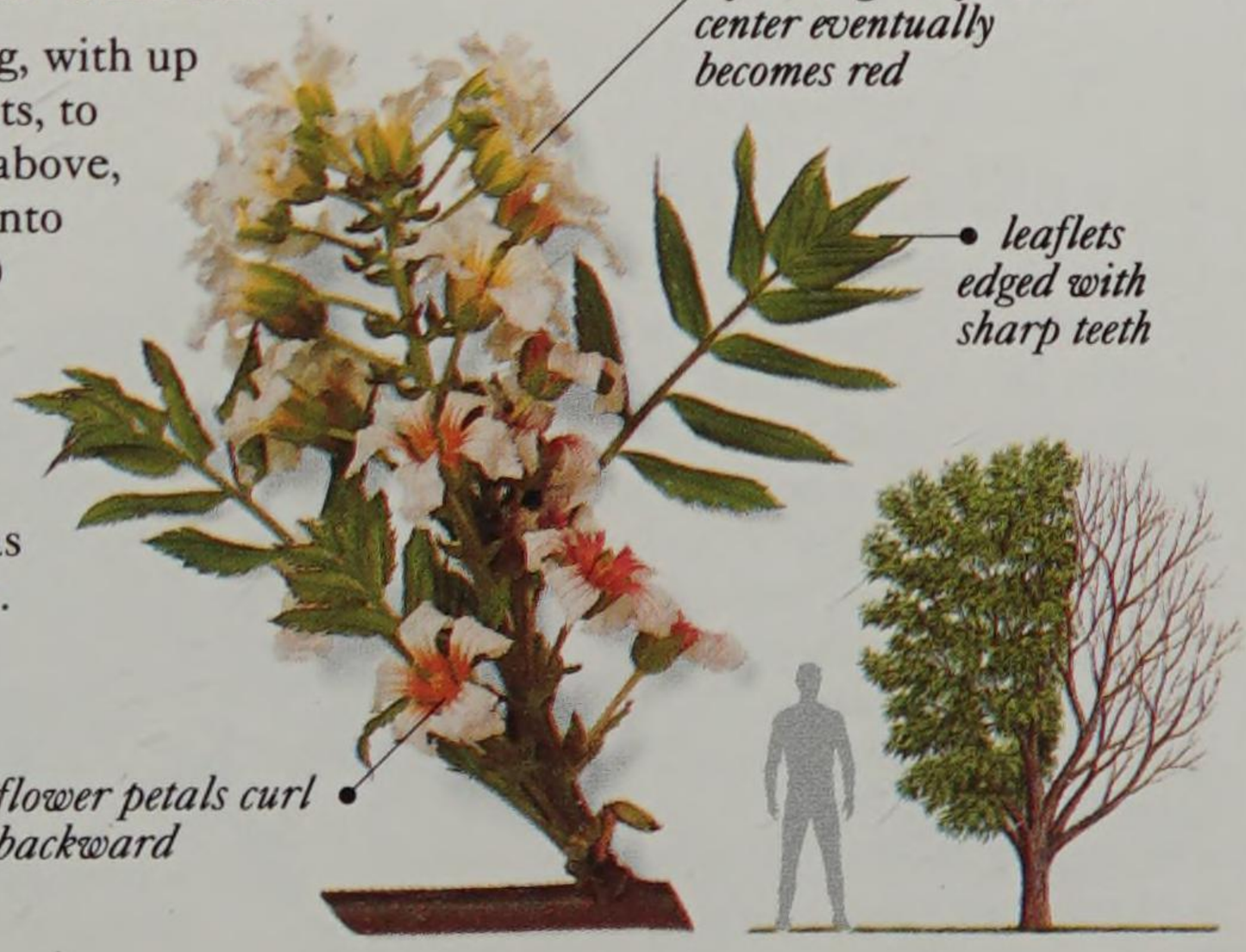
Family SAPINDACEAE	Species *Xanthoceras sorbifolium*	Author Bunge

XANTHOCERAS SORBIFOLIUM

Leaves Pinnate, to 12 in (30 cm) long, with up to 17 narrowly elliptic, toothed leaflets, to 2½ in (6 cm) long, glossy dark green above, smooth. ***Bark*** Gray-brown, fissured into scaly ridges. ***Flowers*** To 1¼ in (3 cm) across, white, with five petals, the petals blotched yellow-green becoming red at the base, in upright racemes to 10 in (25 cm) long, at the ends of the old shoots in late spring as or just after the young leaves emerge. ***Fruit*** A smooth, thick-walled, green capsule, to 2½ in (6 cm) across, broadest at the top, containing several pea-sized seeds.

• **NATIVE REGION** China.

• **HABITAT** Thickets.



Height 26 ft (8 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

SCROPHULARIACEAE

THIS LARGE FAMILY has about 4,500 species and 220 genera of woody and herbaceous plants, found worldwide. The alternate or opposite leaves can be simple or lobed. The flowers have usually a five-lobed, two-lipped corolla. The fruit is a capsule. The trees are all in the genus *Paulownia*.

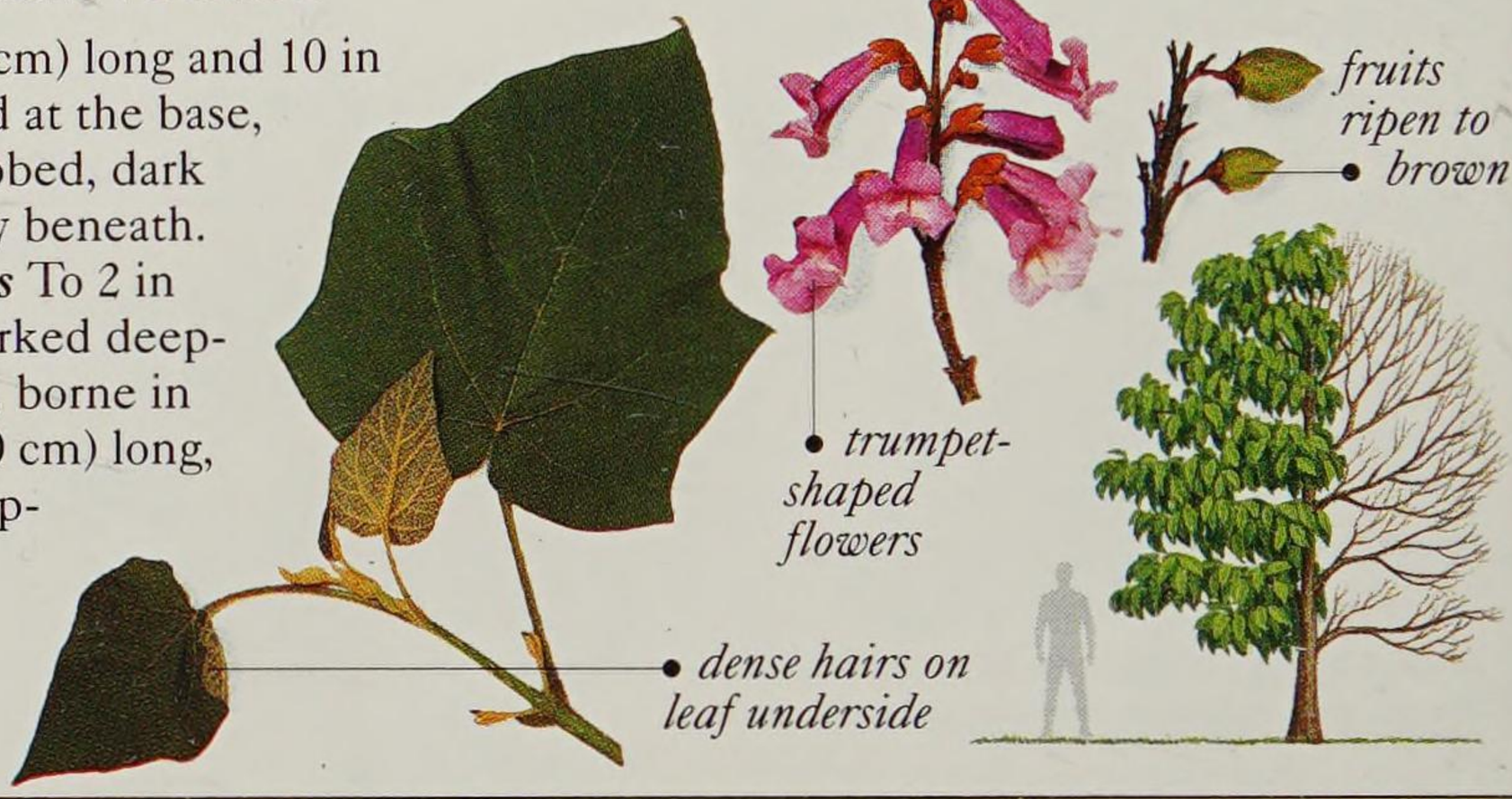
Family SCROPHULARIACEAE	Species *Paulownia tomentosa*	Author (Thunberg) Steudel

PAULOWNIA TOMENTOSA

Leaves Ovate, to 12 in (30 cm) long and 10 in (25 cm) across, heart-shaped at the base, taper-pointed, sometimes lobed, dark green and hairy above, hairy beneath. ***Bark*** Gray, smooth. ***Flowers*** To 2 in (5 cm) long, pale purple marked deeper purple and yellow inside, borne in upright panicles to 16 in (40 cm) long, in spring. ***Fruit*** A woody capsule, to 2 in (5 cm) long.

• **NATIVE REGION** China.

• **HABITAT** Mountains.



Height 50 ft (15 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

SIMAROUBACEAE

THIS FAMILY OF SOME 20 genera and 150 species of trees and shrubs occurs in both tropical and subtropical regions, and temperate regions of Asia. The alternate leaves are often pinnate. The small flowers have five petals; females develop into the fruit, which is dry and winged, or a capsule.

Family SIMAROUBACEAE	Species *Ailanthus altissima*	Author (Miller) Swingle

TREE OF HEAVEN

Leaves Pinnate, to 24 in (60 cm) long, with 15 or more pairs of leaflets, to 4¾ in (12 cm) long and 2 in (5 cm) across, glossy. ***Bark*** Gray-brown, with pale streaks. ***Flowers*** Males and females greenish yellow, with five or six petals, in large panicles at the ends of the shoots, usually on separate plants in mid to late summer. ***Fruit*** Winged, to 1½ in (4 cm) long.

• **NATIVE REGION** China.

• **HABITAT** Mountain woods.

Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

STYRACACEAE

THERE ARE ABOUT 12 GENERA and 150 species of deciduous trees and shrubs in this family, found in east Asia, from the southern United States to Central and South America, with a single species in the Mediterranean. Leaves are alternate and simple. The flower corolla is tubular at the base, and is divided into five to seven lobes. The fruit is usually a capsule.

Family STYRACACEAE	Species *Halesia carolina*	Author Linnaeus

SNOWBELL TREE

Leaves Ovate-oblong, to 8 in (20 cm) long and 4 in (10 cm) across, taper-pointed at the tip, finely toothed, bright green above, paler beneath, thinly hairy on both sides, turning yellow in autumn. ***Bark*** Pale brown, with scaly, interlacing ridges. ***Flowers*** White or white flushed pink, drooping, the bell-shaped corolla ¾ in (2 cm) long, with four shallow lobes, in small clusters in mid- to late spring as the young leaves emerge. ***Fruit*** Pear-shaped, to 2 in (5 cm) long, with four wings, green at first ripening to pale brown.

• **NATIVE REGION**
S.E. United States.

• **HABITAT** Rich, moist woods and alongside streams.

• **REMARK** In unfavorable conditions, this species reaches only about 33 ft (10 m).

young leaves have visibly hairy underside

flowers open in clusters as leaves unfold

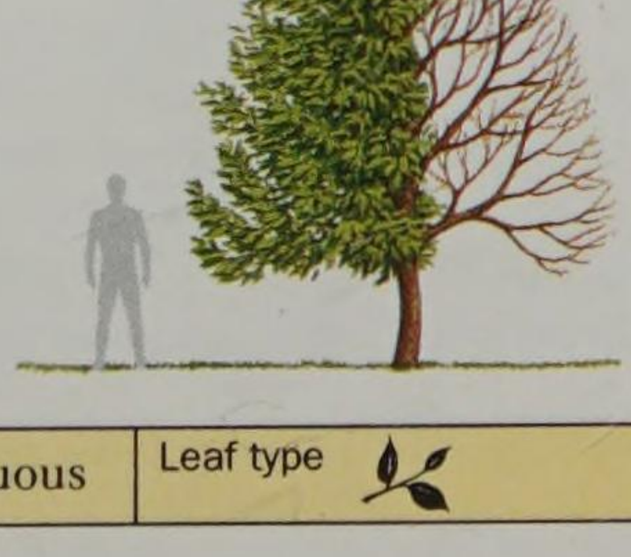
white flower petals may be tinged pink

bell-shaped flowers hang on long stalks

four-sided fruit capsules

slender beak projects from tip of fruit capsule

leaves end in long, tapered point



Height 65 ft (20 m)	Shape Broadly conical	Leaf persistence Deciduous	Leaf type

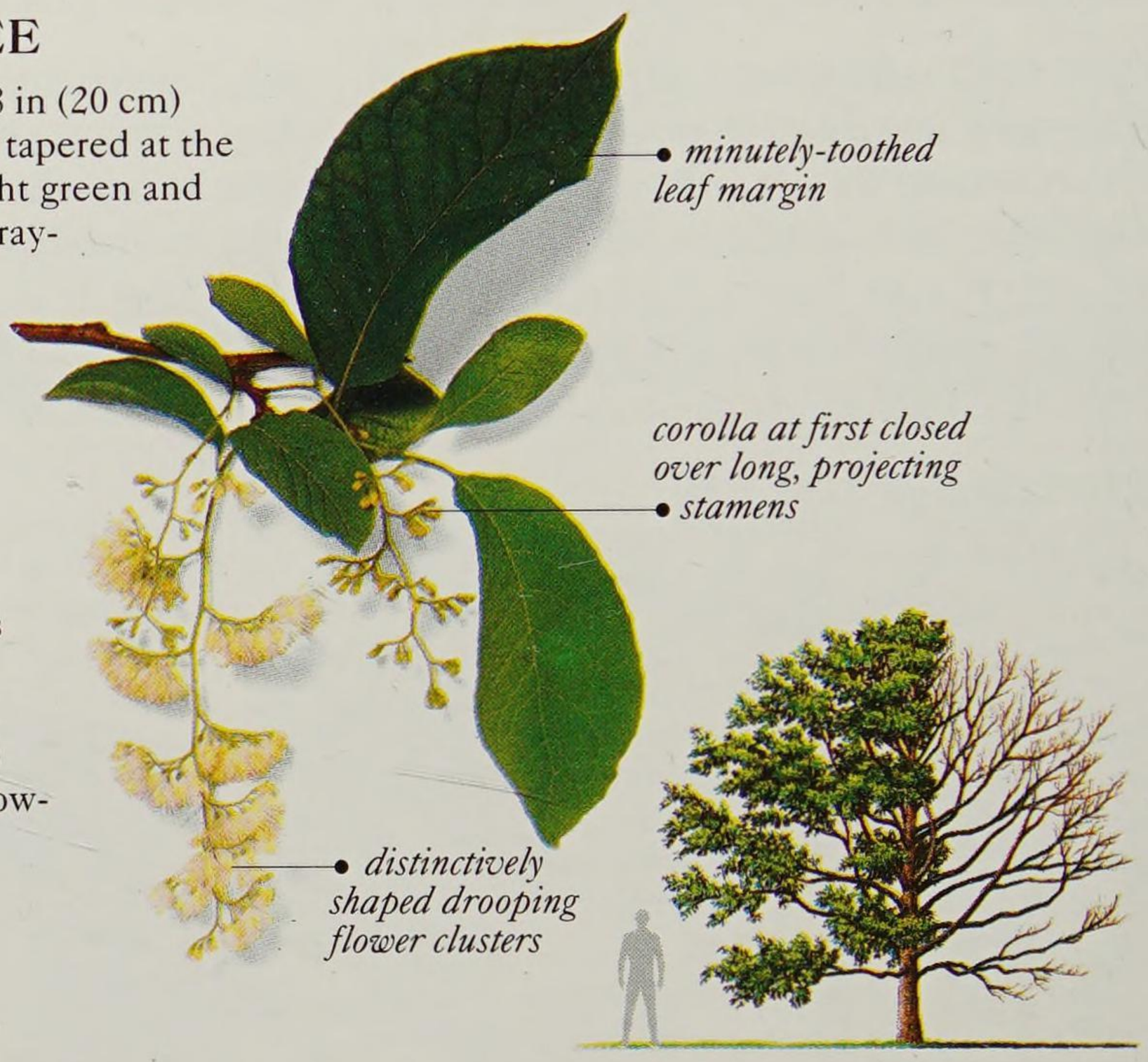
Family STYRACACEAE	Species *Pterostyrax hispida*	Author Siebold & Zuccarini

EPAULETTE TREE

Leaves Oblong to ovate, to 8 in (20 cm) long and 4 in (10 cm) across, tapered at the base, pointed at the tip, bright green and smooth or nearly so above, gray-green and more or less hairy beneath. ***Bark*** Pale gray-brown and corky, with orange fissures. ***Flowers*** Each about ¼ in (6 mm) long, white, fragrant, with conspicuous, exserted stamens, in hanging panicles to 8 in (20 cm) long, in early to midsummer. ***Fruit*** Small, gray, dry, about ½ in (1.2 cm) long, with five ribs, and yellow-brown bristles.

• **NATIVE REGION** China, Japan.

• **HABITAT** Woods and alongside mountain streams.



Height 40 ft (12 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family STYRACACEAE	Species *Styrax hemsleyana*	Author Diels

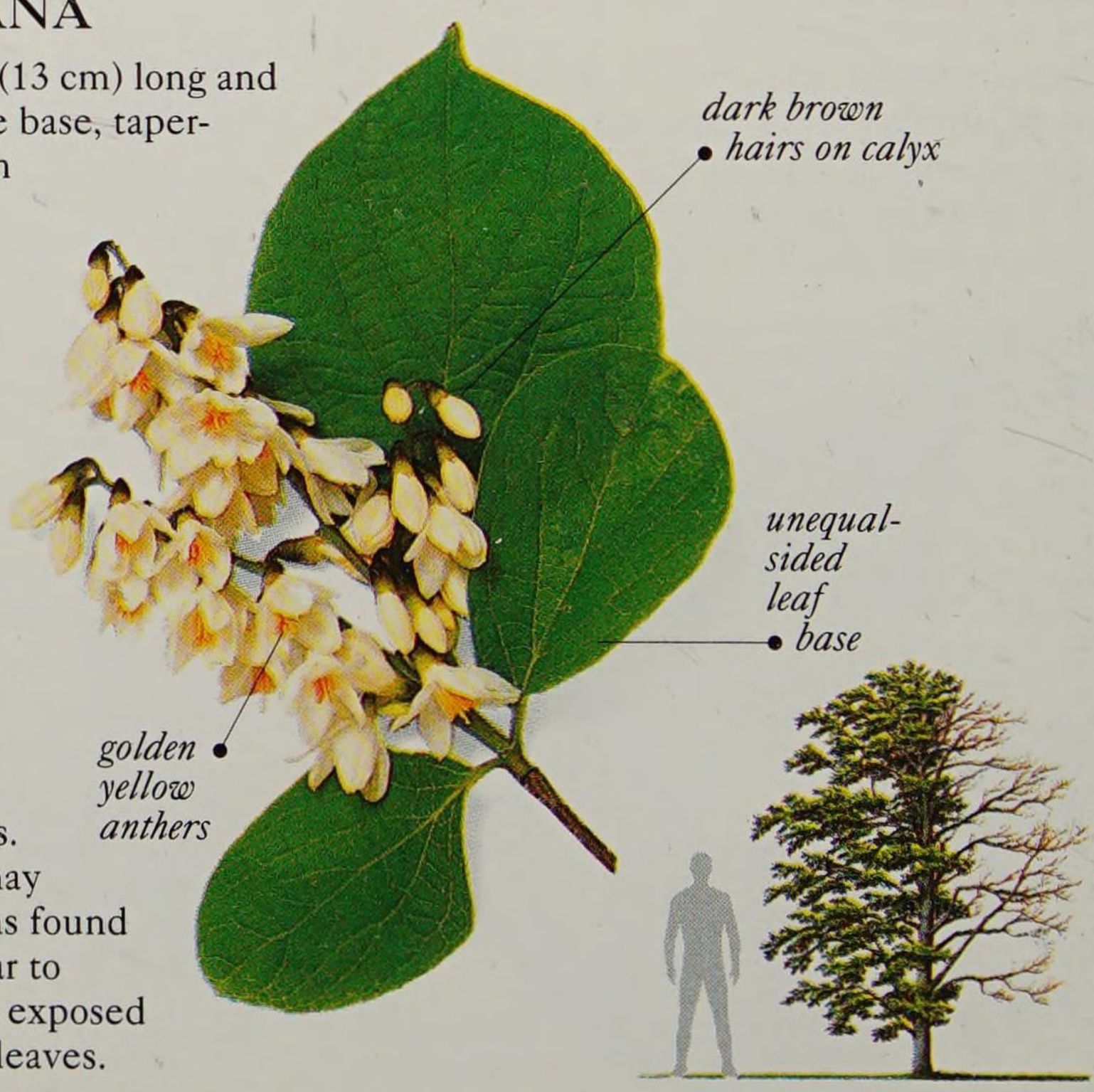
STYRAX HEMSLEYANA

Leaves Ovate to obovate, to 5 in (13 cm) long and 3¼ in (8 cm) across, oblique at the base, taper-pointed, sparsely toothed, smooth or nearly so. ***Bark*** Pale gray. ***Flowers*** About ⅝ in (1.5 cm) long, with a five-lobed corolla, white, with yellow anthers, the calyx densely covered with dark brown hairs, borne in upright to spreading racemes to 6 in (15 cm) long, emerging from the ends of short branches in early summer. ***Fruit*** Egg-shaped, gray and berrylike, ⅝ in (1.5 cm) long, enclosing a single seed.

• **NATIVE REGION** C. China.

• **HABITAT** Woods and thickets.

• **REMARK** Cultivated plants may grow taller than typical specimens found in the wild. This species is similar to *Styrax obassia* (see p.299), but has exposed brown leaf buds and less downy leaves.



Height 26 ft (8 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family STYRACACEAE	Species *Styrax japonica*	Author Siebold & Zuccarini

JAPANESE SNOWBELL

Leaves Elliptic to ovate, to 4 in (10 cm) long and 2 in (5 cm) across, narrowed at the base, abruptly taper-pointed at the tip, with a finely or sparsely toothed margin, rich glossy green above, turning yellow or red in autumn. ***Bark*** Dark gray-brown and smooth, developing orange-brown fissures with age. ***Flowers*** About ⅝ in (1.5 cm) long, with a five-lobed corolla, white or pink-tinged, with yellow anthers, slightly fragrant, on slender stalks, in short racemes or hanging singly beneath the branches in early to midsummer. ***Fruit*** Rounded to egg-shaped, gray, and berrylike, to ⅝ in (1.5 cm) long, with a single seed.

• **NATIVE REGION** China, Japan, Korea.

• **HABITAT** Sunny places, usually on wet ground.

• **REMARK** This species makes a beautiful, elegant small tree or large shrub.

Height 33 ft (10 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family STYRACACEAE	Species *Styrax obassia*	Author Siebold & Zuccarini

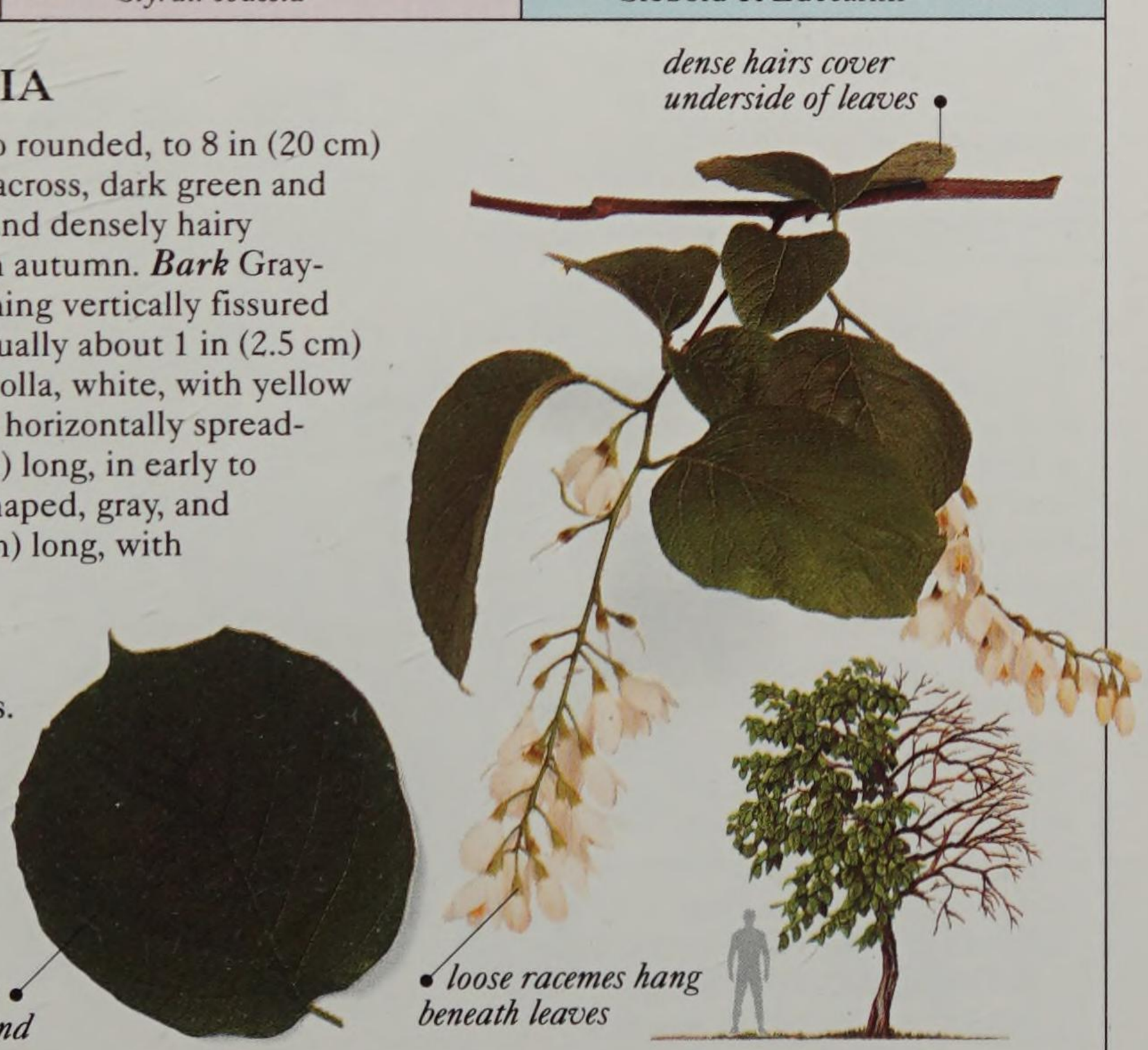
STYRAX OBASSIA

Leaves Variable, elliptic to rounded, to 8 in (20 cm) long and nearly the same across, dark green and smooth above, blue-gray and densely hairy beneath, turning yellow in autumn. ***Bark*** Gray-brown and smooth, becoming vertically fissured with age. ***Flowers*** Individually about 1 in (2.5 cm) long, with a five-lobed corolla, white, with yellow anthers, fragrant, borne in horizontally spreading racemes to 6 in (15 cm) long, in early to midsummer. ***Fruit*** Egg-shaped, gray, and berrylike, about ¾ in (2 cm) long, with a single seed.

• **NATIVE REGION** N. China, Japan, Korea.

• **HABITAT** Moist woods.

• **REMARK** The flower racemes are often almost hidden by the large, broad leaves.



Height 40 ft (12 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

THEACEAE

THE TEA FAMILY has 30 genera and over 600 species of deciduous trees and shrubs. They grow mainly in tropical regions, particularly Asia and the Americas, but also in temperate areas of east Asia and the southeast United States. Leaves are simple and usually alternate. Flowers are typically large and showy, with five petals. The fruit is most often a capsule.

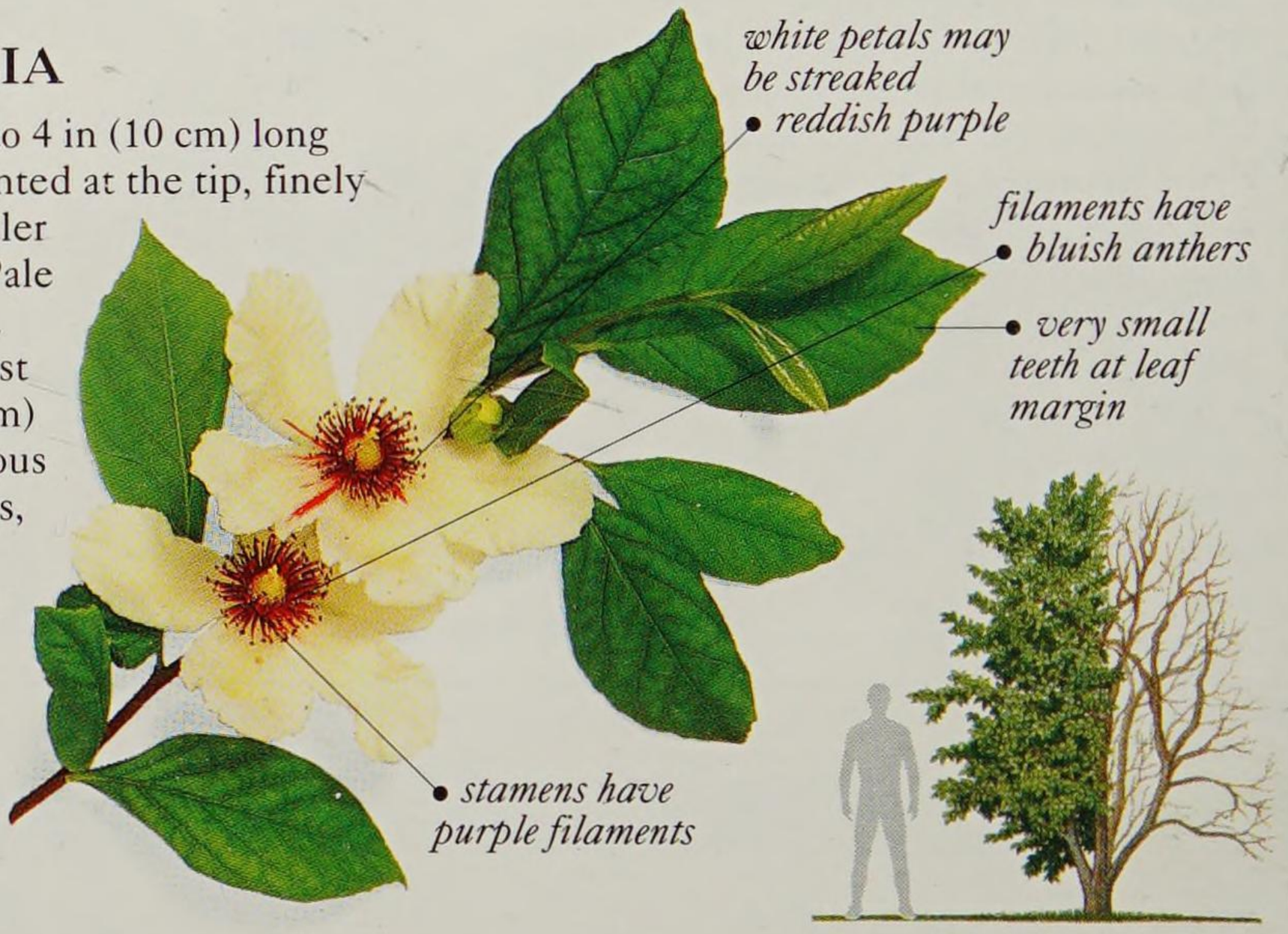
Family THEACEAE	Species *Stewartia malacodendron*	Author Linnaeus

SILKY CAMELLIA

Leaves Ovate to elliptic, to 4 in (10 cm) long and 2 in (5 cm) across, pointed at the tip, finely toothed, smooth above, paler and hairy beneath. ***Bark*** Pale gray to brown and smooth. ***Flowers*** Cup-shaped at first opening widely, 4 in (10 cm) across, white, with numerous stamens and bluish anthers, borne singly in summer. ***Fruit*** A woody, red-brown capsule, about ⅝ in (1.5 cm) across.

• **NATIVE REGION** S.E. United States.

• **HABITAT** Moist woods on coastal plain.



Height 20 ft (6 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family THEACEAE	Species *Stewartia monadelpha*	Author Siebold & Zuccarini

STEWARTIA MONADELPHA

Leaves Elliptic to ovate, to 4 in (10 cm) long and 1¼ in (3 cm) across, taper-pointed, toothed, glossy dark green above, thinly hairy on both sides, turning deep red-purple in autumn. ***Bark*** Smooth, peeling in flakes, leaving gray, pale brown, and red-brown patches. ***Flowers*** 1½ in (4 cm) across, white, with five petals, the stamens with creamy filaments and dark anthers, with two leafy bracts, borne singly or in pairs in the leaf axils in summer. ***Fruit*** A woody, red-brown capsule, about ⅜ in (1 cm) long.

• **NATIVE REGION** S. Japan, Korea.

• **HABITAT** Mountain woods.

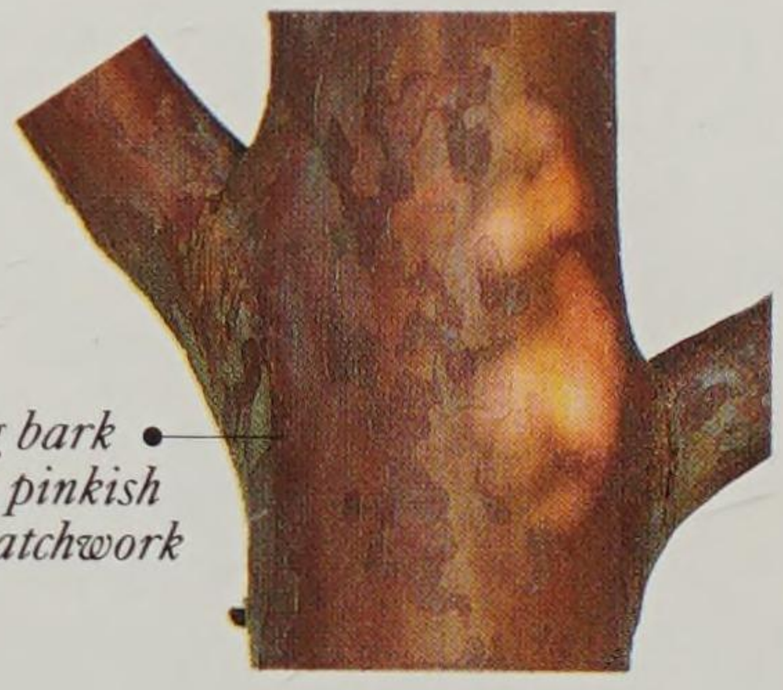
Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family THEACEAE	Species *Stewartia pseudocamellia*	Author Maximowicz

STEWARTIA PSEUDOCAMELLIA

Leaves Broadly ovate to elliptic, to 4 in (10 cm) long and 2½ in (6 cm) across, tapered to a short point, finely toothed, dark green and smooth above, smooth or hairy beneath, turning yellow to orange or red in autumn. ***Bark*** Red-brown, peeling in thin, irregular plates, leaving gray and pink patches. ***Flowers*** 2½ in (6 cm) across, white, with five petals, the numerous stamens with yellow filaments and darker anthers, with two leafy bracts outside the sepals, borne singly or in pairs in the leaf axils in summer. ***Fruit*** A woody, red-brown capsule, about ¾ in (2 cm) long.

- **NATIVE REGION** Japan.
- **HABITAT** Mountain woods.
- **REMARK** As in other species of *Stewartia*, the five flower petals are joined together at the base and the flowers fall intact.



flaking bark creates pinkish gray patchwork effect

frilly-petaled flowers

flowers have bright yellow filaments

△ **VAR. KOREANA**
The flowers of this native South Korean variety open more widely than those of the typical form. Its slightly larger leaves color just as well in autumn, however.

finely toothed leaf margin

▽ **STEWARTIA PSEUDOCAMELLIA**

paler leaf underside may be smooth or hairy

flower petals covered in silky hairs before opening

dark green leaf upperside

Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

TILIACEAE

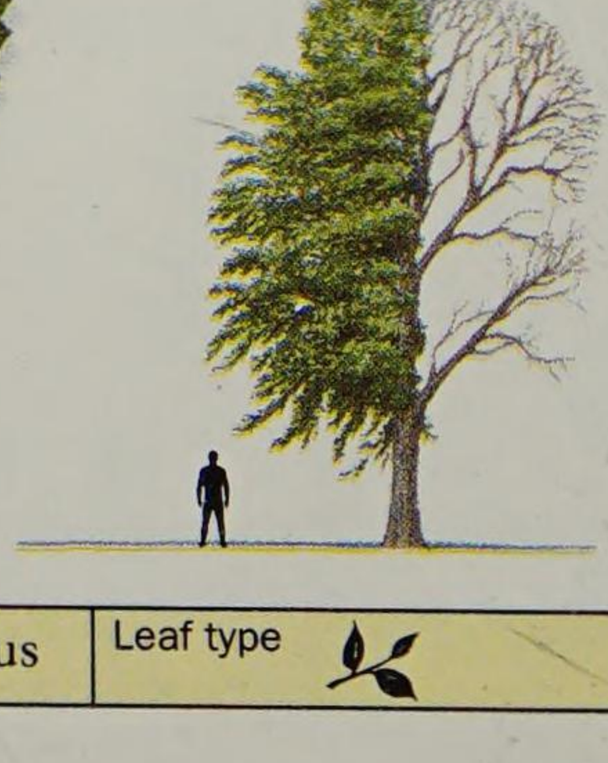
THE LIMES, or lindens, of the genus *Tilia* are well-loved members of this family, which includes more than 700 species of trees, shrubs, and herbaceous plants, in some 50 genera. Most are confined to the tropics, but the limes occur in temperate regions of the northern hemisphere. The leaves are alternate and sometimes lobed, frequently with starry hairs. The often fragrant flowers are small, usually with five petals and sepals, and numerous stamens. The fruit is variable, and may be woody, a dry capsule, or a berry.

Family TILIACEAE	Species *Tilia americana*	Author Linnaeus

AMERICAN LINDEN

Leaves Broadly ovate to nearly rounded, to 8 in (20 cm) long and 6 in (15 cm) across, abruptly tapered to a fine tip with coarse, pointed teeth, matte deep green above, paler and glossy beneath, becoming smooth on both sides except for tufts of brown hairs in the vein axils beneath. ***Bark*** Brown to gray, cracked into long, scaly ridges. ***Flowers*** ⅝ in (1.5 cm) across, pale yellow, with five petals, fragrant, in pendulous clusters of up to ten, each cluster with an oblong bract to 4 in (10 cm) long, in midsummer. ***Fruit*** Rounded, woody, pale gray-green, about ⅜ in (1 cm) across.

- **NATIVE REGION** E. North America.
- **HABITAT** Moist woods.
- **REMARK** Also known as basswood, lime, whitewood.



Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

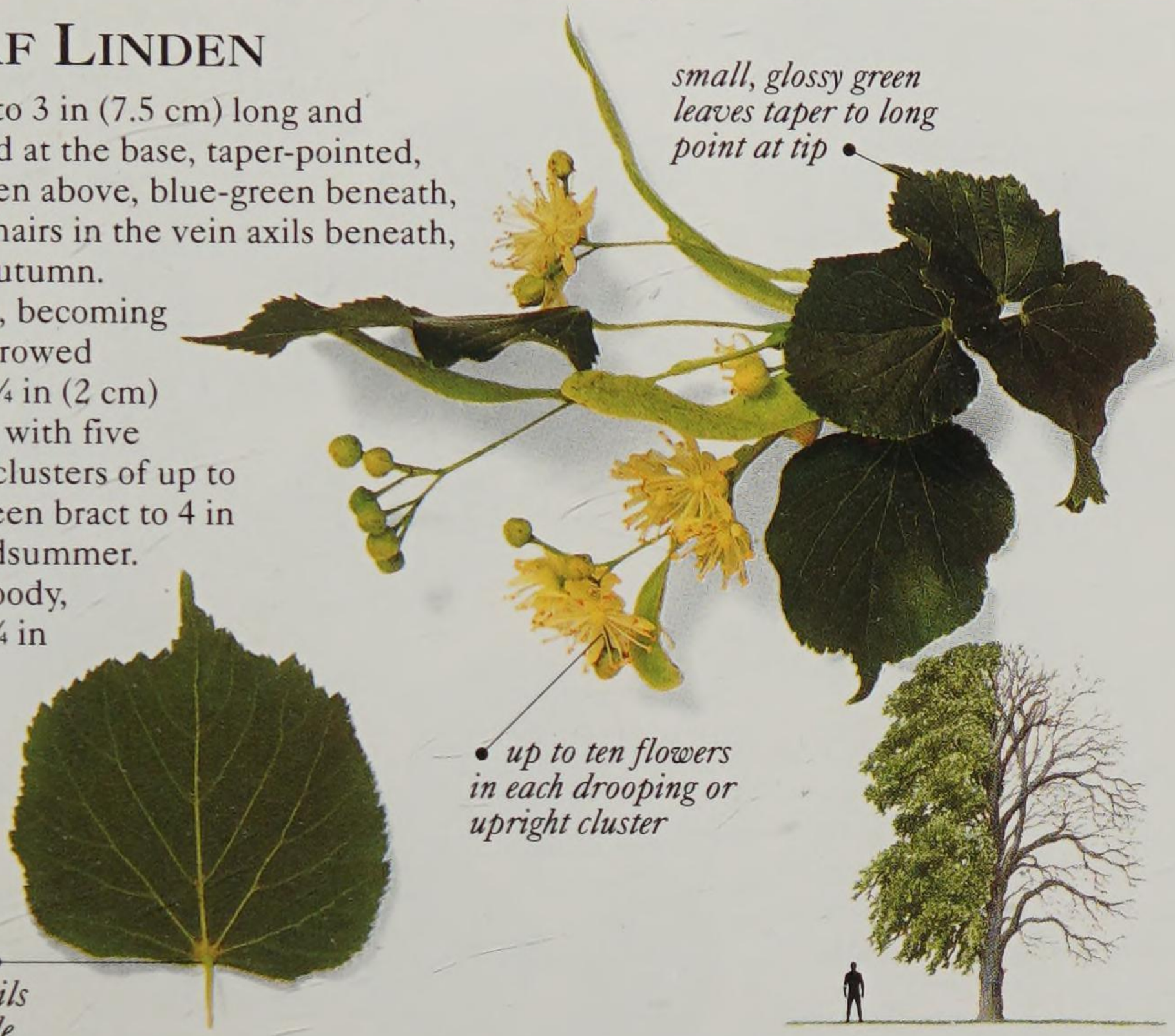
Family TILIACEAE	Species *Tilia cordata*	Author Miller

LITTLELEAF LINDEN

Leaves Rounded, to 3 in (7.5 cm) long and across, heart-shaped at the base, taper-pointed, toothed, glossy green above, blue-green beneath, smooth except for hairs in the vein axils beneath, turning yellow in autumn. ***Bark*** Gray, smooth, becoming gray-brown and furrowed with age. ***Flowers*** ¾ in (2 cm) across, pale yellow, with five petals, fragrant, in clusters of up to ten, each with a green bract to 4 in (10 cm) long in midsummer. ***Fruit*** Rounded, woody, gray-green, about ¼ in (6 mm) across.

• **NATIVE REGION** W. Asia, Europe.

• **HABITAT** On limestone.



Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

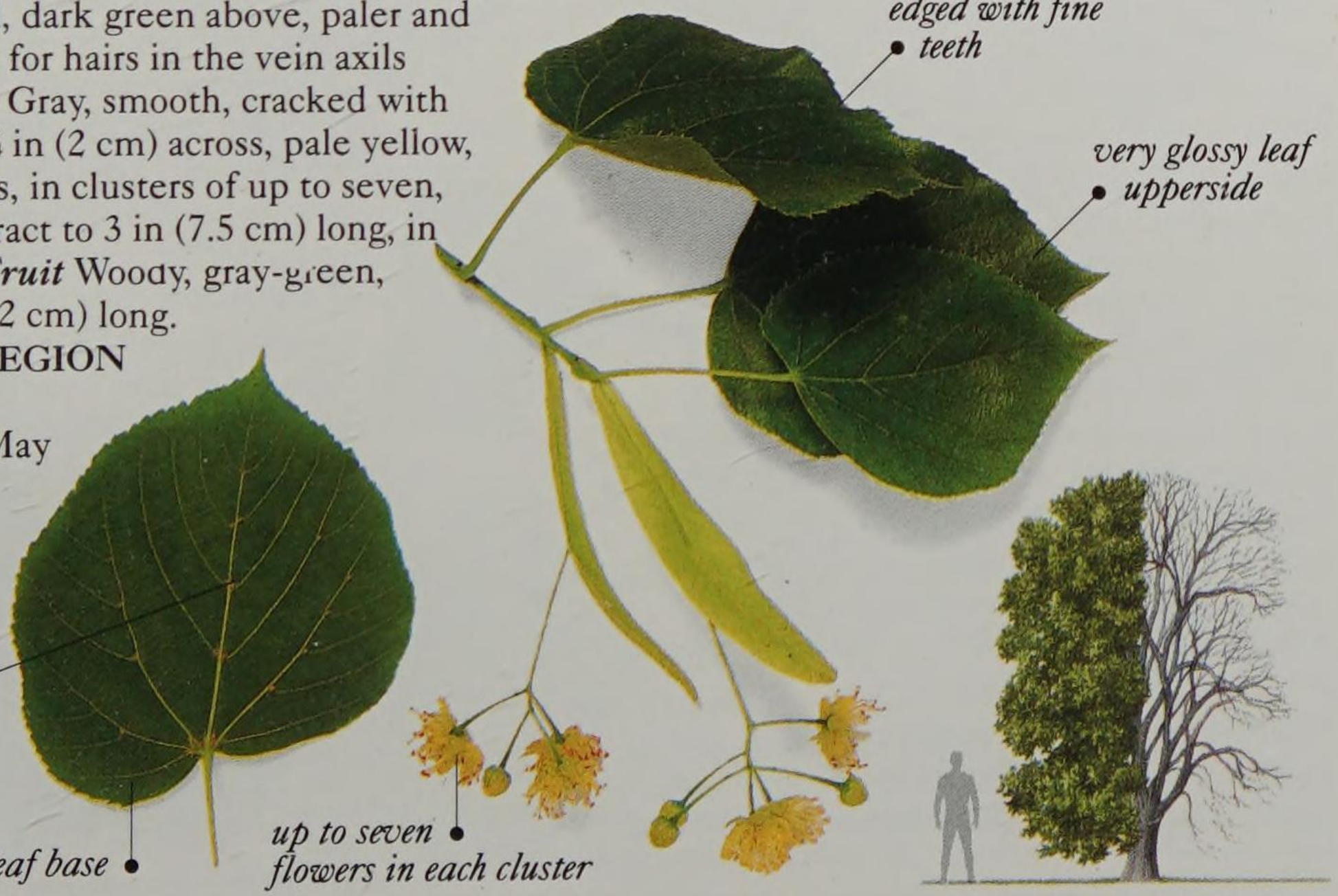
Family TILIACEAE	Species *Tilia* x *euchlora*	Author K. Koch

CRIMEAN LINDEN

Leaves Broadly ovate, to 4 in (10 cm) long and across, pointed, dark green above, paler and smooth except for hairs in the vein axils beneath. ***Bark*** Gray, smooth, cracked with age. ***Flowers*** ¾ in (2 cm) across, pale yellow, with five petals, in clusters of up to seven, with a green bract to 3 in (7.5 cm) long, in midsummer. ***Fruit*** Woody, gray-green, about ½ in (1.2 cm) long.

• **NATIVE REGION** Not known.

• **REMARK** May be a hybrid between *T. dasystyla* and *T. cordata*.



Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

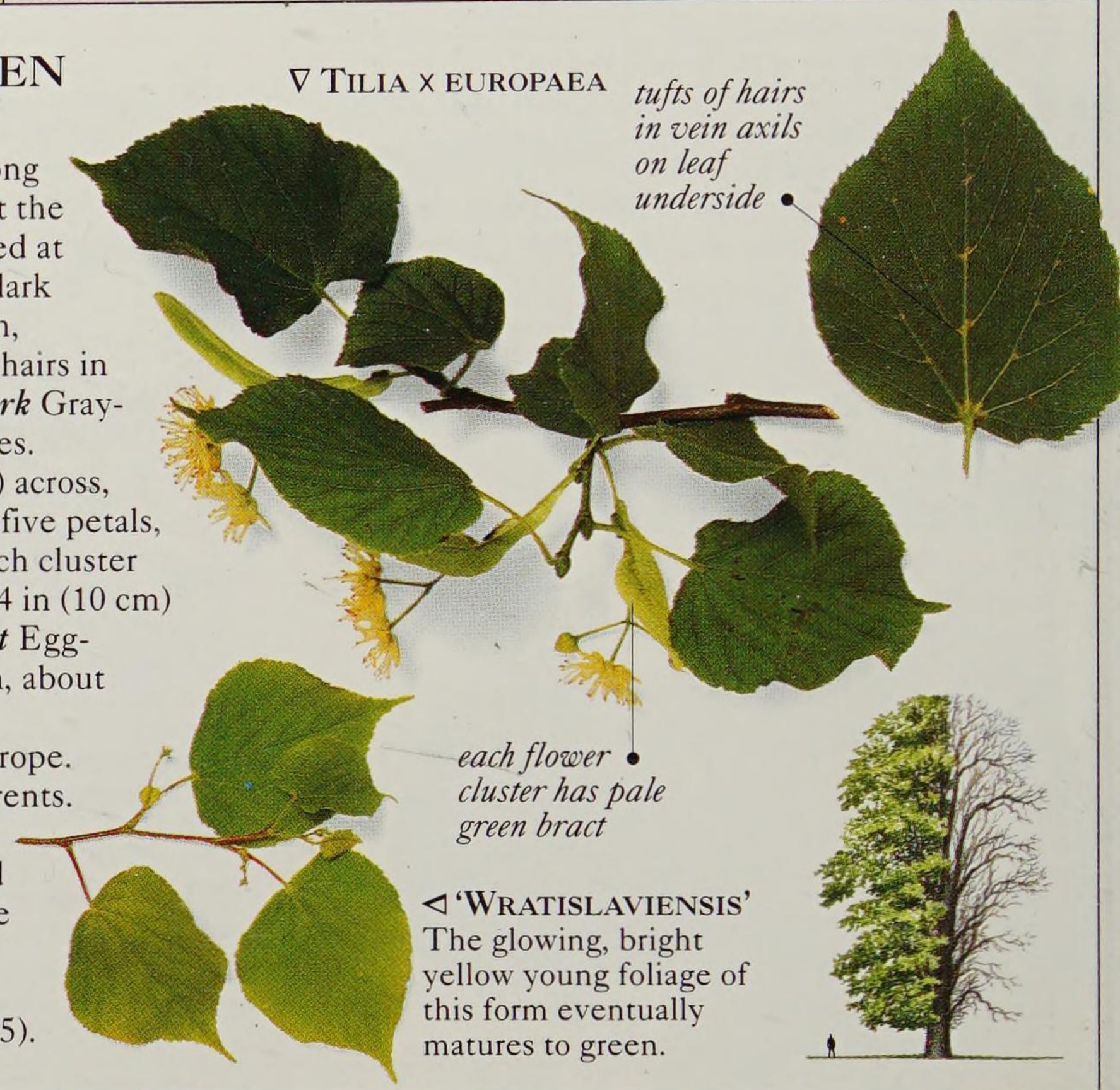
Family TILIACEAE	Species *Tilia x europaea*	Author Linnaeus

COMMON LINDEN

Leaves Broadly ovate to rounded, to 4 in (10 cm) long and across, heart-shaped at the base, abruptly short-pointed at the tip, coarsely toothed, dark green above, paler beneath, smooth except for tufts of hairs in the vein axils beneath. ***Bark*** Gray-brown, with shallow fissures. ***Flowers*** Small, ¾ in (2 cm) across, pale yellow, fragrant, with five petals, in clusters of up to ten, each cluster with a pale green bract to 4 in (10 cm) long, in midsummer. ***Fruit*** Egg-shaped, woody, gray-green, about ½ in (1.2 cm) long.

- **NATIVE REGION** Europe.
- **HABITAT** With the parents.
- **REMARK** Also known as *Tilia x vulgaris*. A hybrid between small-leaved lime *(Tilia cordata*, see p.303) and broad-leaved lime *(Tilia platyphyllos*, see p.305).

▽ **TILIA X EUROPAEA**



◁ **'WRATISLAVIENSIS'** The glowing, bright yellow young foliage of this form eventually matures to green.

Height 130 ft (40 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family TILIACEAE	Species *Tilia mongolica*	Author Maximowicz

MONGOLIAN LINDEN

Leaves Broadly ovate, to 3 in (7.5 cm) long and across, with three to five lobes, taper-pointed at the tip, sharply toothed, reddish when young becoming glossy dark green above, blue-green beneath, smooth on both sides except for tufts of hair in the vein axis beneath, turning yellow in autumn, on red stalks. ***Bark*** Gray and smooth. ***Flowers*** Small, ¾ in (2 cm) across, pale yellow, fragrant, with five petals, borne in drooping clusters of up to 20, each clusters with a narrow, pale green bract to 4 in (10 cm) long, in mid-summer. ***Fruit*** Rounded, woody, gray-green, ½ in (1.2 cm) long.

- **NATIVE REGION** N.E. Asia.
- **HABITAT** Mountain slopes.
- **REMARK** Easily identified in season by its distinctively lobed, sharply toothed leaves.

Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family TILIACEAE	Species *Tilia platyphyllos*	Author Scopoli

BROAD-LEAVED LINDEN

Leaves Rounded to broadly ovate, to 4¾ in (12 cm) long and across, heart-shaped at the base, tapering to a short point at the tip, sharply toothed, dark green above, paler beneath, hairy on both sides especially beneath, turning yellow in autumn. ***Bark*** Gray, with shallow fissures. ***Flowers*** Small, ¾ in (2 cm) across, pale yellow, fragrant, with five petals, in drooping clusters of about five, each cluster with a pale green bract to 4¾ in (12 cm) long, in early to midsummer. ***Fruit*** Woody, gray-green, ½ in (1.2 cm) long, with five ribs.

• **NATIVE REGION**
S.W. Asia, Europe.

• **HABITAT** Moist woods.

◁ **'LACINIATA'**
This unusual form has narrowly ovate, twisted leaves.

Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family TILIACEAE	Species *Tilia tomentosa*	Author Moench

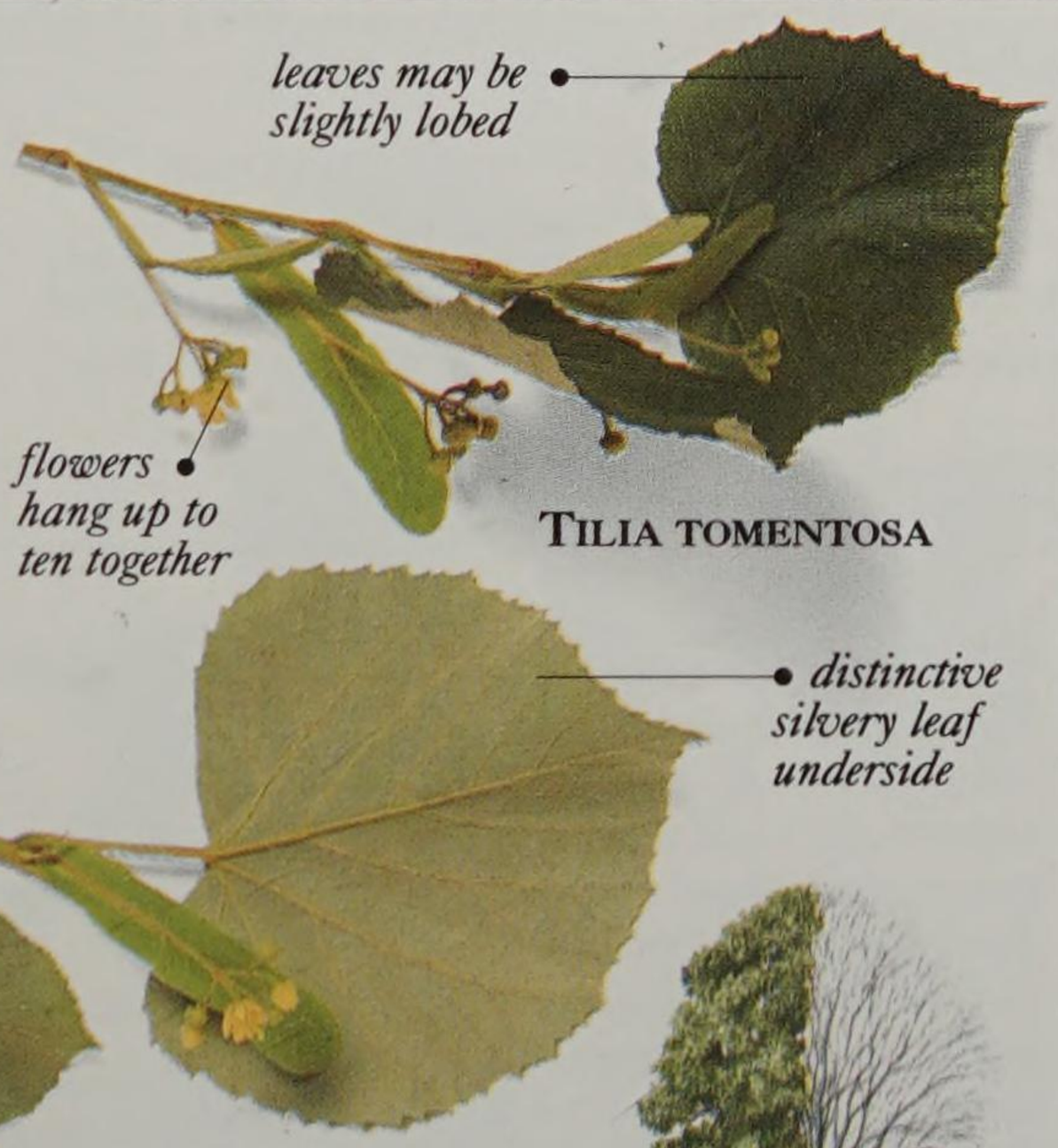
SILVER LINDEN

Leaves Rounded, to 4¾ in (12 cm) long and 4 in (10 cm) across, often slightly lobed, usually obliquely heart-shaped at the base, tapering to a short point at the tip, sharply toothed, dark green above, white-hairy beneath. ***Bark*** Gray, with shallow ridges. ***Flowers*** Small, ¾ in (2 cm) across, pale yellow, highly fragrant, with five petals, in drooping clusters of up to ten, each cluster with a pale green bract to 4 in (10 cm) long, in mid- to late summer. ***Fruit*** Rounded to egg-shaped, woody, gray-green, to ½ in (1.2 cm) long.

• **NATIVE REGION**
S.W. Asia, S.E. Europe.

• **HABITAT**
Mixed deciduous and evergreen woods.

• **REMARK**
Also known as *Tilia argentea*. The rich-scented flowers are lethal to bees.



◁ **'PETIOLARIS'**
The weeping silver lime is a form selected for its pendulous shoots and longer-stalked leaves.

Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

TROCHODENDRACEAE

A SINGLE GENUS WITH ONE species, described below, belongs to this family. Its affinities are uncertain, although is generally agreed to be relatively primitive among flowering plants. It is usually thought to be most closely related to either *Cercidiphyllum* (see p.133) or *Drimys* (see p.310).

Family TROCHODENDRACEAE	Species *Trochodendron aralioides*	Author Siebold & Zuccarini

TROCHODENDRON ARALIOIDES

Leaves Narrowly elliptic, to 4¾ in (12 cm) long and 1½ in (4 cm) across, toothed except towards the base, dark green above, paler beneath. ***Bark*** Gray to dark brown, with conspicuous lenticels. ***Flowers*** ¾ in (2 cm) across, bright green, without petals, the stamens radiating from a green disk, in racemes to 4¾ in (12 cm) long, at the ends of the shoots in late spring and early summer. ***Fruit*** A hemispherical cluster, green ripening to brown, with persistent stigmas.

• **NATIVE REGION** Japan, Korea, Taiwan.

• **HABITAT** Mountain woods.

Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Evergreen	Leaf type

ULMACEAE

THE ELM FAMILY contains about 15 genera and 150 species of evergreen and deciduous trees and shrubs, growing wild in tropical and northern temperate regions. Leaves are usually alternate. The small flowers have no petals. The fruit may be winged and dry, fleshy with a single seed, or a nut.

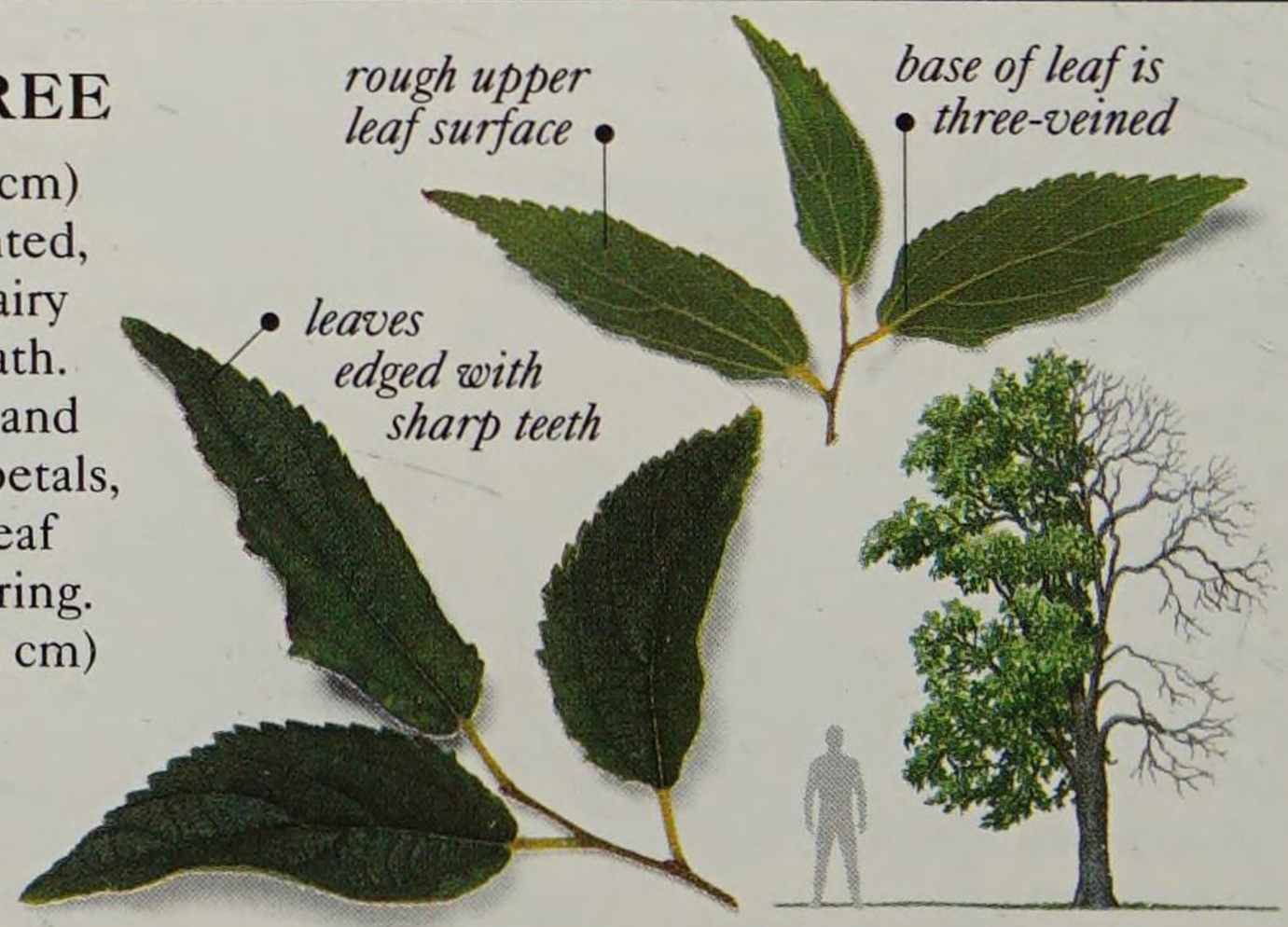
Family ULMACEAE	Species *Celtis australis*	Author Linnaeus

SOUTHERN NETTLE TREE

Leaves Lanceolate to ovate, to 6 in (15 cm) long and 2 in (5 cm) across, slender-pointed, rather light to dark green and roughly hairy above, gray-green and softly hairy beneath. ***Bark*** Pale gray, smooth. ***Flowers*** Males and females both small and green, without petals, either singly or in small clusters in the leaf axils, separately on the same plant in spring. ***Fruit*** Rounded, berrylike, about ⅜ in (1 cm) across, nearly black when ripe.

• **NATIVE REGION** S.W. Asia, S. Europe.

• **HABITAT** Warm, dry, rocky slopes.



Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ULMACEAE	Species *Celtis laevigata*	Author Willdenow

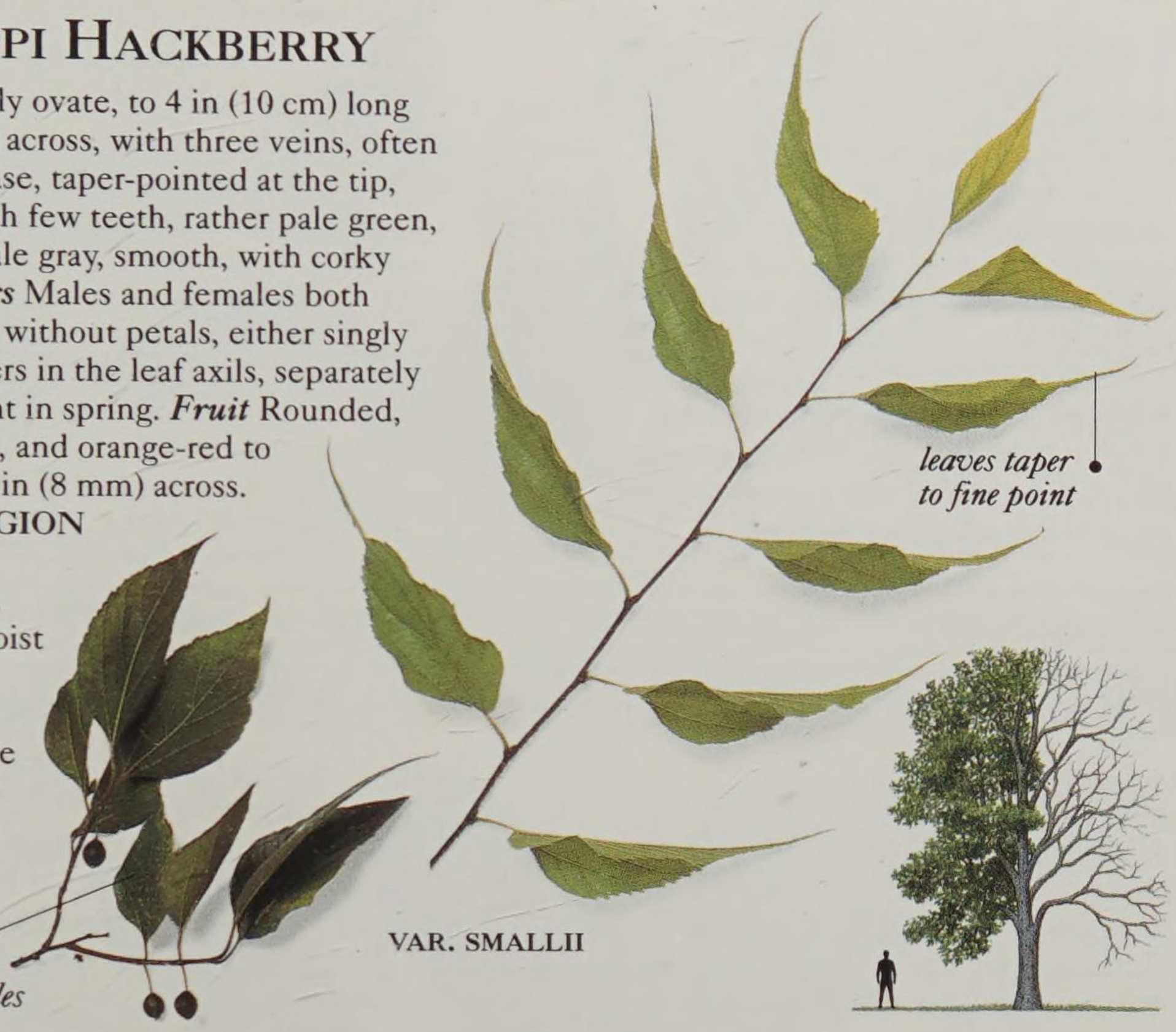
MISSISSIPPI HACKBERRY

Leaves Narrrowly ovate, to 4 in (10 cm) long and 1½ in (4 cm) across, with three veins, often oblique at the base, taper-pointed at the tip, untoothed or with few teeth, rather pale green, smooth. ***Bark*** Pale gray, smooth, with corky lenticels. ***Flowers*** Males and females both small and green, without petals, either singly or in small clusters in the leaf axils, separately on the same plant in spring. ***Fruit*** Rounded, berrylike, edible, and orange-red to purple, about 5/16 in (8 mm) across.

• **NATIVE REGION** N. Mexico, S. United States.

• **HABITAT** Moist flood plains and woods.

• **REMARK** The form shown, var. *smallii*, has more prominently toothed leaves.



VAR. SMALLII

Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ULMACEAE	Species *Celtis occidentalis*	Author Linnaeus

HACKBERRY

Leaves Ovate, to 4¾ in (12 cm) long and 2½ in (6 cm) across, with three veins, often oblique at the base, taper-pointed, toothed, smooth or rough above, hairy beneath. ***Bark*** Gray and smooth, with corky warts, furrowed and scaly with age. ***Flowers*** Males and females both small and green, without petals, singly or in small clusters in the leaf axils, separately on the same plant in spring. ***Fruit*** Rounded, berrylike, edible, and orange-red to purple, about 3/8 in (1 cm) across.

• **NATIVE REGION** North America.

• **HABITAT** Rich woods and hill slopes.

• **REMARK** Can be either a tree or a shrub.

Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ULMACEAE	Species *Ulmus x hollandica*	Author Miller

ULMUS X HOLLANDICA

Leaves Ovate to elliptic, to 4¾ in (12 cm) long and 2½ in (6 cm) across, taper-pointed, toothed, usually hairy beneath. ***Bark*** Gray-brown, ridged. ***Flowers*** Tiny, red, borne in clusters on the shoots in early spring. ***Fruit*** A winged seed, to 1 in (2.5 cm) long.

- **NATIVE REGION** Europe.
- **HABITAT** Woods and hedgerows.
- **REMARK** A hybrid between wych elm *(Ulmus glabra)* and smooth-leaved elm *(Ulmus minor*, see below).

'KLEMMER'
This form was raised in Belgium. It is a narrowly conical tree.

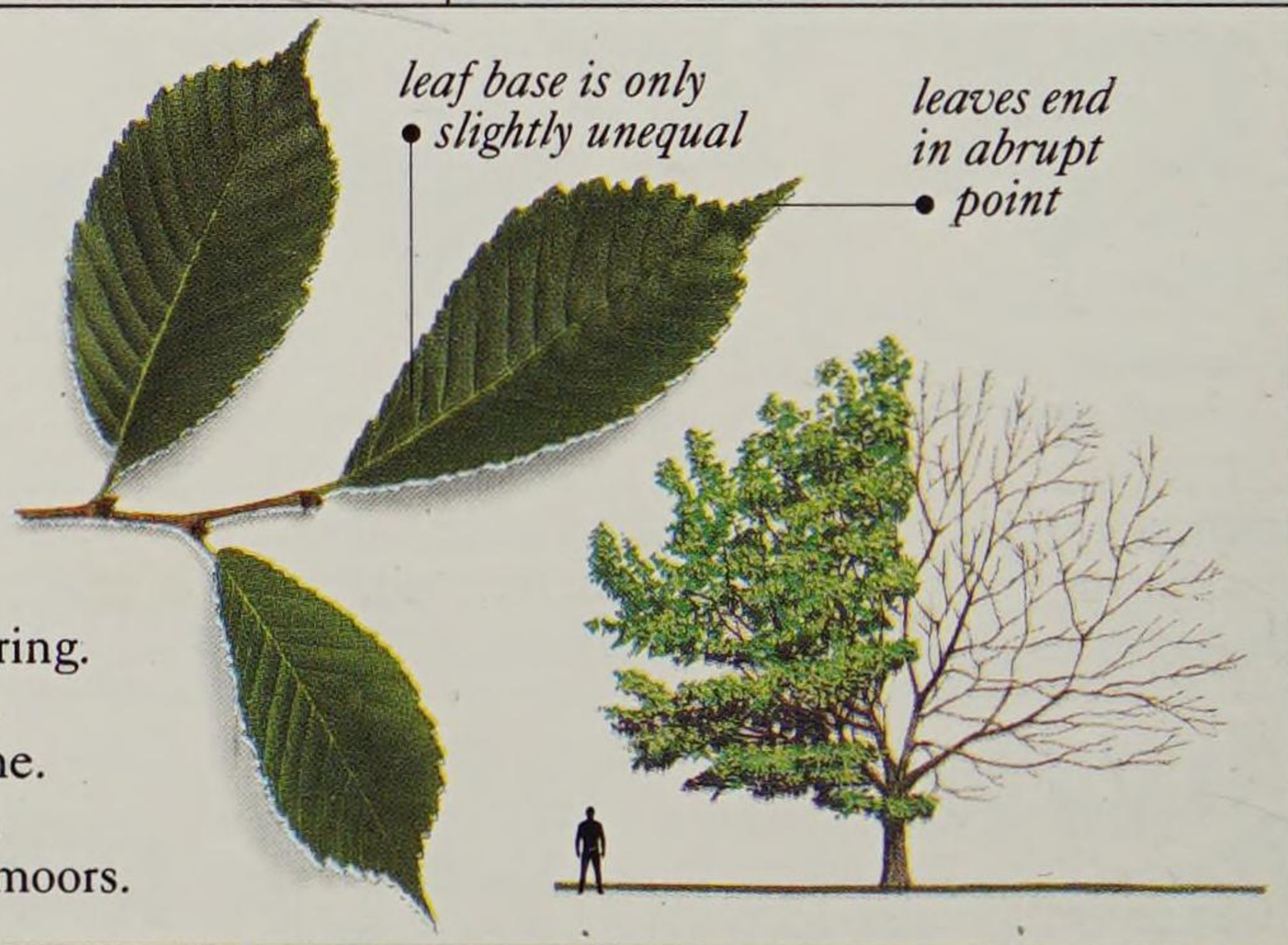
Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ULMACEAE	Species *Ulmus japonica*	Author (Rehder) Sargent

JAPANESE ELM

Leaves Elliptic to obovate, to 4 in (10 cm) long and 2½ in (6 cm) across, narrowed at the unequal base, taper-pointed at the tip, double-toothed, dark green and rough with hairs above, paler and downy at least on the veins beneath. ***Bark*** Pale gray-brown, fissured. ***Flowers*** Very small, red, in small clusters on the shoots in spring. ***Fruit*** A winged seed, ⅝ in (1.5 cm) long, ripening a few weeks after flowering time.

- **NATIVE REGION** N.E. Asia, Japan.
- **HABITAT** Woods, rocky places, and moors.



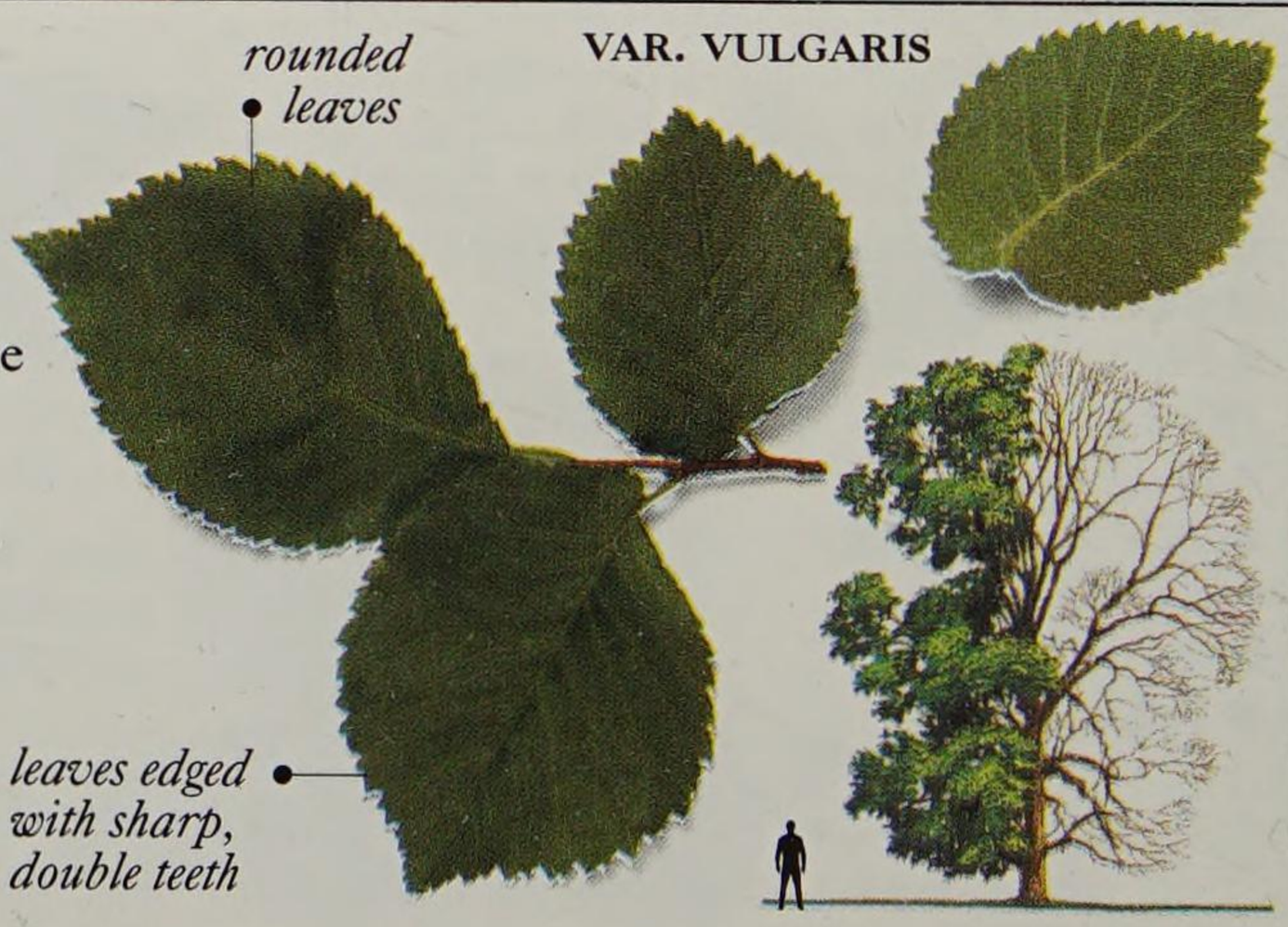
Height 100 ft (30 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ULMACEAE	Species *Ulmus minor*	Author Miller

SMOOTH-LEAVED ELM

Leaves Elliptic to obovate, to 4¾ in (12 cm) long and 2½ in (6 cm) across, pointed, double-toothed, glossy bright green and smooth above, with hairs in the vein axils beneath. ***Bark*** Gray-brown, ridged. ***Flowers*** Tiny, red, in clusters in early spring. ***Fruit*** A small, winged seed.

- **NATIVE REGION** N. Africa, S.W. Asia, Europe.
- **HABITAT** Woods and hedgerows.
- **REMARK** The form shown, var. *vulgaris* (formerly *U. procera)*, is the once-common English elm.



Height 100 ft (30 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

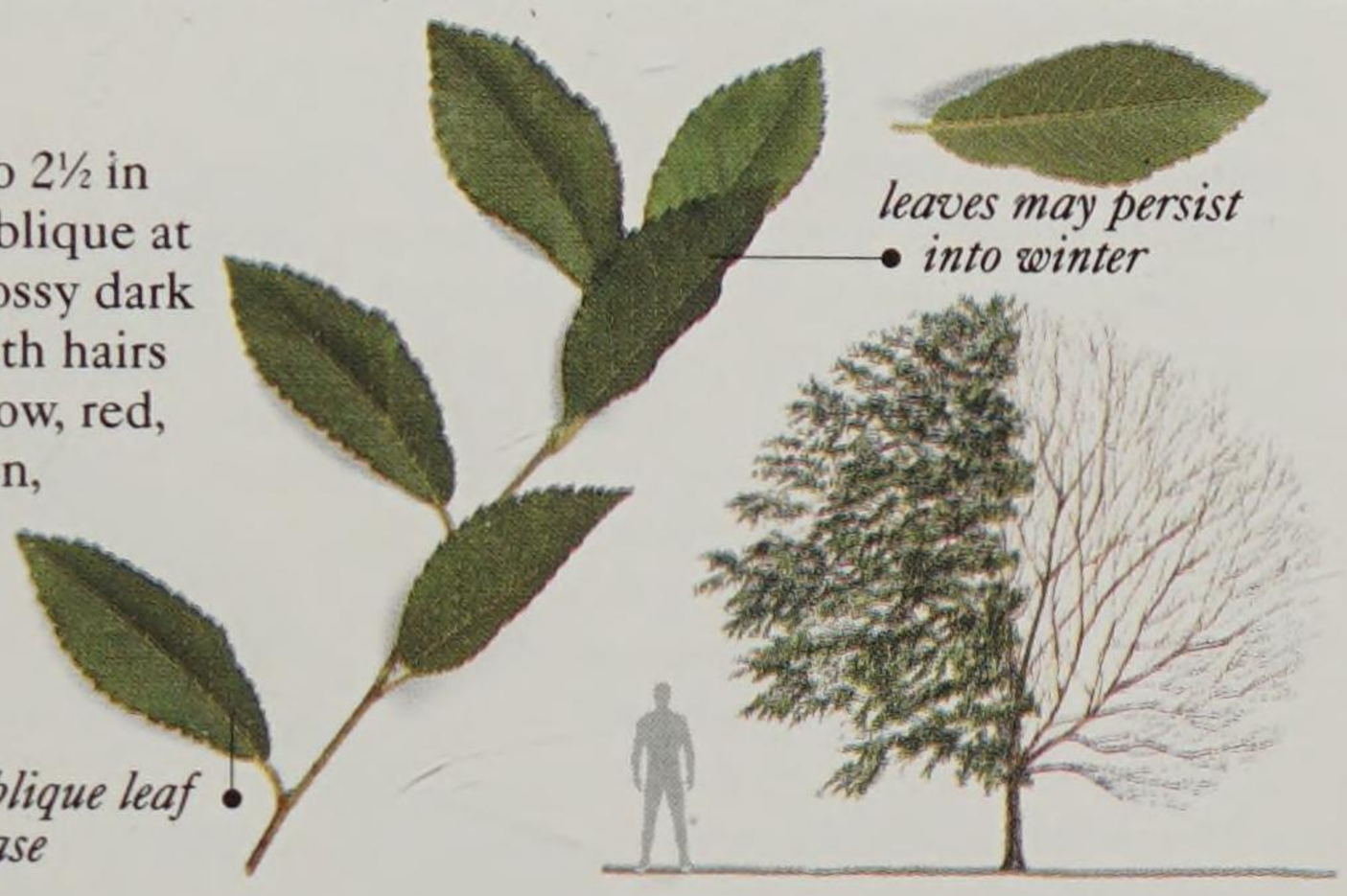
Family ULMACEAE	Species *Ulmus parvifolia*	Author Jacquin

CHINESE ELM

Leaves Elliptic to ovate or obovate, to 2½ in (6 cm) long and 1½ in (4 cm) across, oblique at the base, pointed, sharply toothed, glossy dark green and sometimes rough above, with hairs in the vein axils beneath, turning yellow, red, or purple in autumn. ***Bark*** Gray-brown, peeling in scales. ***Flowers*** Tiny, red, in clusters in the leaf axils in early autumn. ***Fruit*** A small seed with a green wing, 5/16 in (8 mm) long.

• **NATIVE REGION** E. Asia.

• **HABITAT** Rocky places.



Height 50 ft (15 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

Family ULMACEAE	Species *Ulmus pumila*	Author Linnaeus

SIBERIAN ELM

Leaves Elliptic to narrowly ovate, to 2½ in (6 cm) long and 1 in (2.5 cm) across, nearly equal-sided at the base, taper-pointed, sharply toothed, dark green above, smooth on both sides. ***Bark*** Gray-brown, rough, corrugated. ***Flowers*** Very small, red, in clusters on the shoots in spring before leaves. ***Fruit A*** small seed surrounded by a rounded, notched, green wing, ½ in (1.2 cm) long.

• **NATIVE REGION** C. to E. Asia.

• **HABITAT** Sandy or stony soil.

Height 65 ft (20 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

Family ULMACEAE	Species *Zelkova carpinifolia*	Author (Pallas) K. Koch

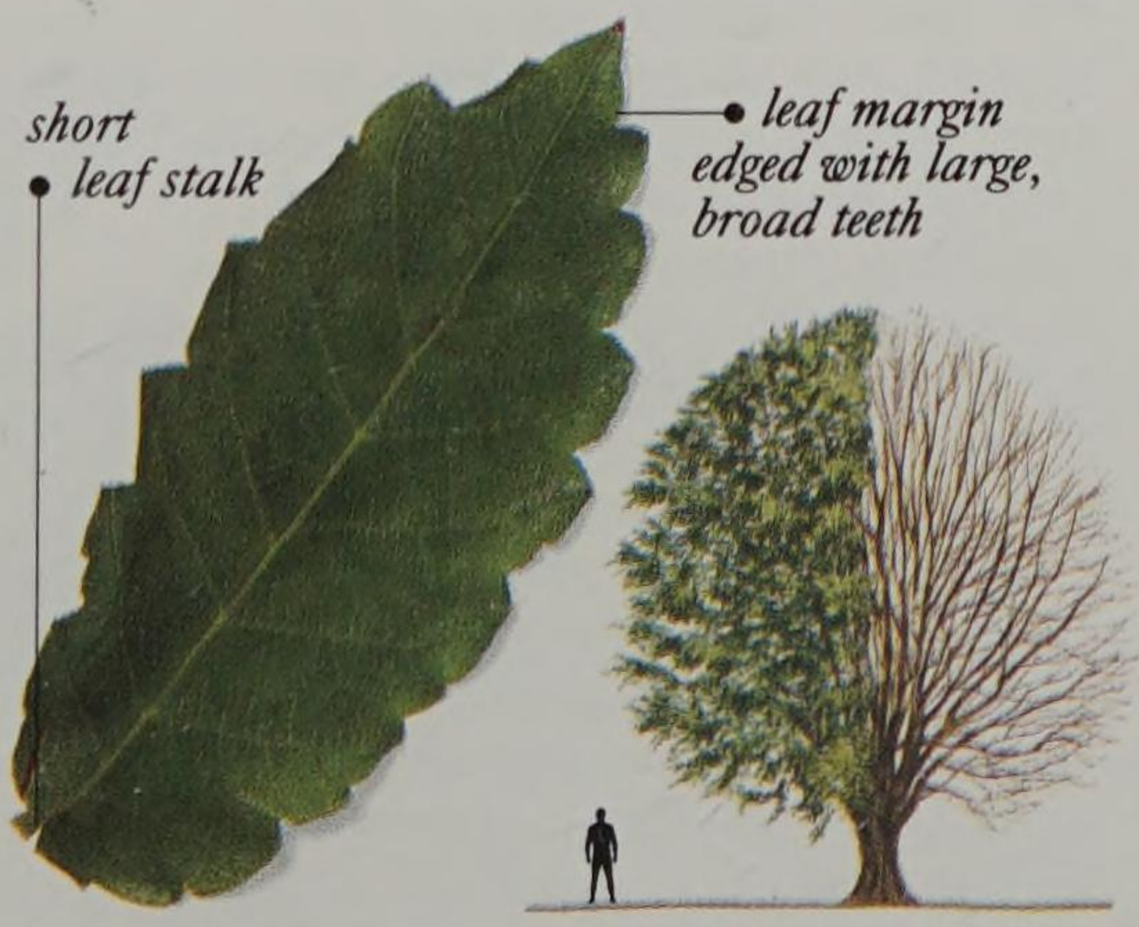
ZELKOVA CARPINIFOLIA

Leaves Elliptic to oblong, to 4 in (10 cm) long and 2 in (5 cm) across, with about ten pairs of veins ending in triangular teeth, dark green and slightly rough above, hairy beneath, turning orange-brown in autumn. ***Bark*** Gray and smooth, flaking with age, on a fluted trunk. ***Flowers*** Males and females both small and green, in separate clusters on the same plant in spring. ***Fruit*** Small and rounded.

• **NATIVE REGION** Caucasus, N. Iran.

• **HABITAT** Forests.

• **REMARK** Easily distinguished by its short trunk divided into numerous upright branches.



Height 80 ft (25 m)	Shape Broadly columnar	Leaf persistence Deciduous	Leaf type

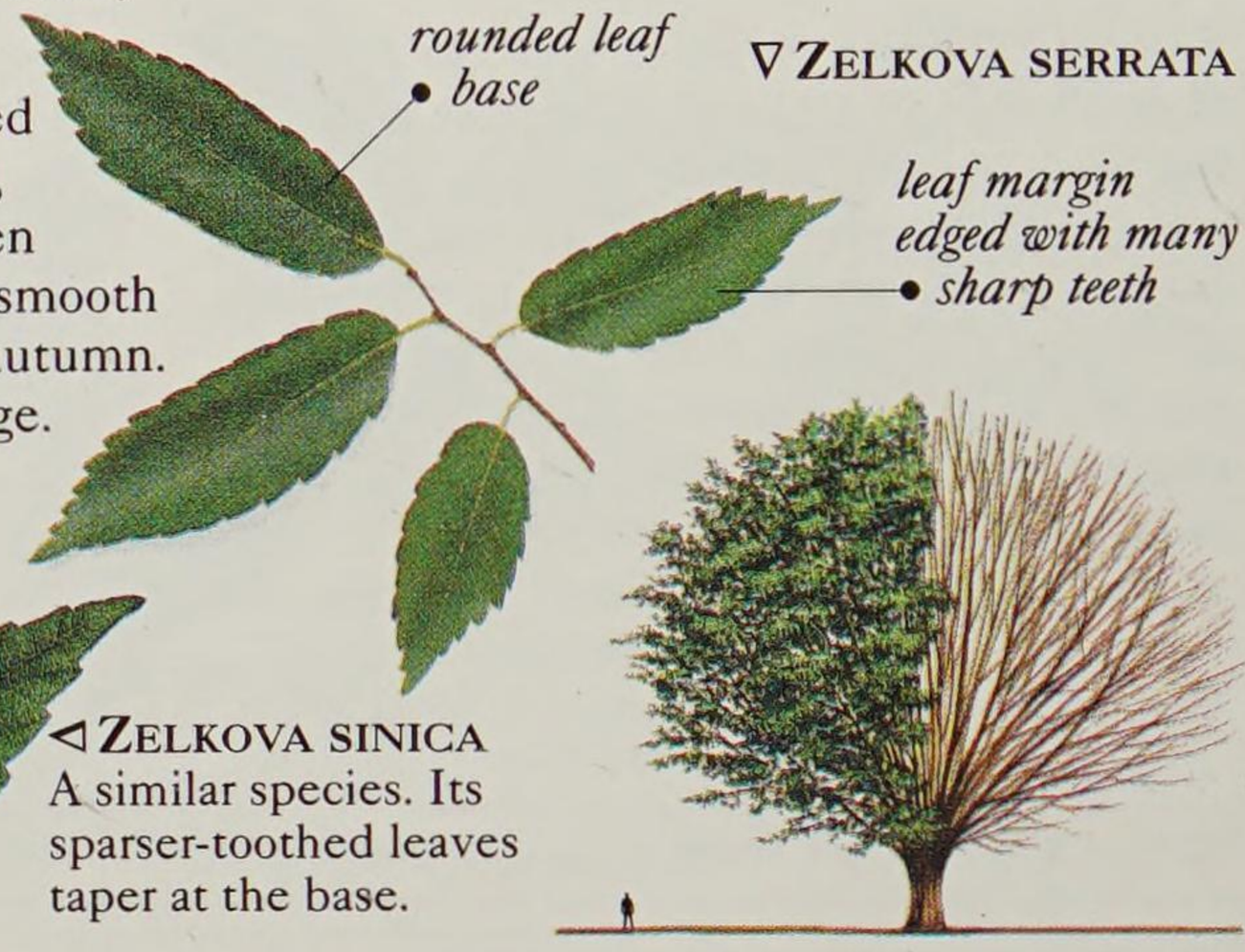
Family ULMACEAE	Species *Zelkova serrata*	Author (Thunberg) Makino

JAPANESE ZELKOVA (KEAKI)

Leaves Ovate to oblong-ovate, to 4¾ in (12 cm) long and 2 in (5 cm) across, rounded at the base, taper-pointed, sharply toothed, the teeth ending in a short point, dark green and slightly rough above, paler and nearly smooth beneath, turning yellow, orange, or red in autumn. ***Bark*** Pale gray and smooth, flaking with age. ***Flowers*** Males and females both small and green, on the young shoots on the same plant in spring. ***Fruit*** Small and rounded.

• **NATIVE REGION** China, Japan, Korea.

• **HABITAT** Moist soil near streams.



▽ **ZELKOVA SERRATA**

◁ **ZELKOVA SINICA** A similar species. Its sparser-toothed leaves taper at the base.

Height 130 ft (40 m)	Shape Broadly spreading	Leaf persistence Deciduous	Leaf type

WINTERACEAE

A PRIMITIVE FAMILY, possibly related to the magnolias *(Magnolia*, see pp.202–215). About five genera and 60 species of evergreen trees and shrubs occur in Madagascar, and from Mexico to South America, and Southeast Asia to Australia and New Zealand. Plants have alternately arranged, untoothed leaves, five- or more petaled flowers, and small, berrylike clustered fruits.

Family WINTERACEAE	Species *Drimys winteri*	Author J. R. & J. G. Forster

WINTER'S BARK

Leaves Oblong to elliptic, to 8 in (20 cm) long and 2½ in (6 cm) across, untoothed, glossy dark green above, bluish green to bluish white beneath, leathery, aromatic when crushed. ***Bark*** Gray-brown and smooth, very aromatic. ***Flowers*** 1½ in (4 cm) across, white, fragrant, with numerous slender petals, borne in large clusters in spring to early summer. ***Fruit*** A small berry, green ripening to purple-black, in clusters at the end of long stalks.

• **NATIVE REGION** Mexico, South America.

• **HABITAT** Mountains.

• **REMARK** Named after Captain William Winter, who sailed with Sir Francis Drake in the sixteenth century. He used the bark (a source of vitamin C) to treat scurvy, a disease caused by a deficiency of the same vitamin.

Height 50 ft (15 m)	Shape Narrowly conical	Leaf persistence Evergreen	Leaf type

GLOSSARY

TECHNICAL TERMS have been kept to a minimum, but a limited use of them is unavoidable in a book of this kind. Words in **bold** in the definitions are explained elsewhere in the glossary.

You may also find it useful to look at HYBRID PLANTS (p.8), A FAMILY TREE (p.9), WHAT IS A TREE? (pp.12–13), THE PARTS OF A TREE (pp.14–15), and CONIFER OR BROADLEAF? (pp.16–17).

• ANTHER
Part of a **stamen** that releases **pollen**.

• ARIL
Fleshy seed coat.

• AURICLE
Small, earlike **lobe**.

• BIPINNATE
Pinnate, with the divisions themselves pinnate.

• BLOOMY
Covered with a waxy or powdery blue-white deposit.

• BRACT
Leaflike structure below a flower or flower cluster.

• CALYX
Small part of a flower outside the petals, composed of **sepals**.

• CAPSULE
Dry fruit that splits open to release its seeds.

• CATKIN
Usually pendulous cluster of **bracts** and tiny flowers, most often of one sex.

• COMPOUND LEAF
One that is composed of two or more separate **leaflets**.

• COROLLA
Often showy and colored part of a flower, composed of petals.

• DECIDUOUS
Without leaves for part of each year.

• ENTIRE
Without teeth or **lobes**.

• EVERGREEN
Retaining leaves for more than one year.

• EXSERTED
Conspicuously protruding.

• FILAMENT
Stalk of an **anther**.

• GLAUCOUS
Bluish white.

• HARDY
Able to withstand winter temperatures.

• HERBACEOUS PLANT
Nonwoody plant that dies at the end of the growing season or overwinters by means of underground structures.

• LEAF AXIL
Angle formed between a leaf and its stem.

• LEAFLET
Single division of a **compound leaf**.

• LENTICEL
Usually corky area on a trunk that lets air through the bark.

• LOBE
Rounded segment or part.

• MONOTYPIC
Of a family: containing a single genus that contains only one species; of a genus: containing a single species.

• NATIVE
Growing naturally wild in a specific area.

• NATURALIZED
Introduced by man and growing as if naturally wild in a specific area.

• OVARY
Organ of a flower's female part that, in fruit, contains the seeds.

• PALMATE
Divided into **leaflets** or **lobes** in the manner of a hand.

• PANICLE
Raceme in which the branches are themselves branched.

• PEALIKE
Of a flower: similar in structure to that of a leguminous plant.

• PERSISTENT
Remaining attached.

• PINNATE
Compound leaf, with **leaflets** arranged on opposite sides of a common stalk.

• POLLEN
Spores or grains released from the **anthers**, containing the male reproductive element.

• RACEME
Stalked flowers borne singly along a central axis.

• RACHIS
Stalk of a **pinnate** leaf on which the **leaflets** are borne.

• SEPAL
Individual part of the **calyx**.

• SIMPLE LEAF
One that is not divided into **leaflets**.

• SINUS
Gap between two **lobes**.

• SPIKE
Raceme bearing unstalked flowers.

• STAMEN
Anther, usually on a **filament**. A variable number composes the male part of a flower.

• STIGMA
Organ of a flower's female part, borne at the tip of the **style**, on which the **pollen** is deposited.

• STIPULE
Small, leaflike structure, most often paired, borne where the leaf stalk joins the stem.

• STYLE
Organ of a flower's female part that bears the **stigma**.

• TEPAL
Petal or **sepal**, where there is no distinct difference between the two.

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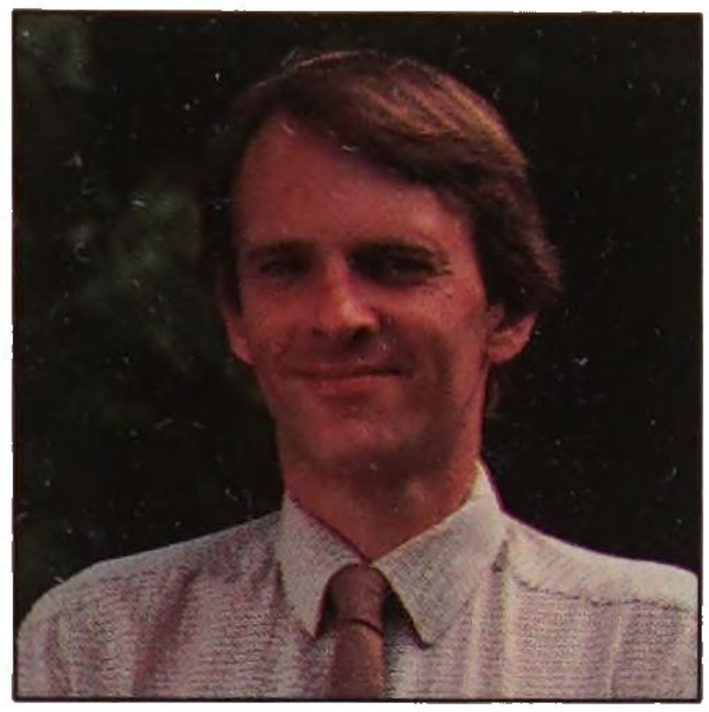

Allen J. Coombes is Botanist at the Sir Harold Hillier Gardens and Arboretum in Hampshire, England. Author of *The Collingridge Dictionary of Plant Names* and *Bowood's Trees and Shrubs*, he has also contributed to such important horticultural works as *The Royal Horticultural Society Gardeners' Encyclopedia of Plants & Flowers* and *The European Garden Flora*. Most recently, he has undertaken a major revision of the prestigious *Hillier Manual of Trees & Shrubs*.

The taxonomy and nomenclature of woody plants are Allen's particular interests. A member of the Horticultural Taxonomy Group, he regularly exchanges information with an international network of friends and colleagues. In his leisure time he enjoys field trips abroad, and has led several botanical tours to places such as Swedish Lapland, the Pyrenees, Turkey, and Andalusia. Allen lives with his wife and two daughters in England.

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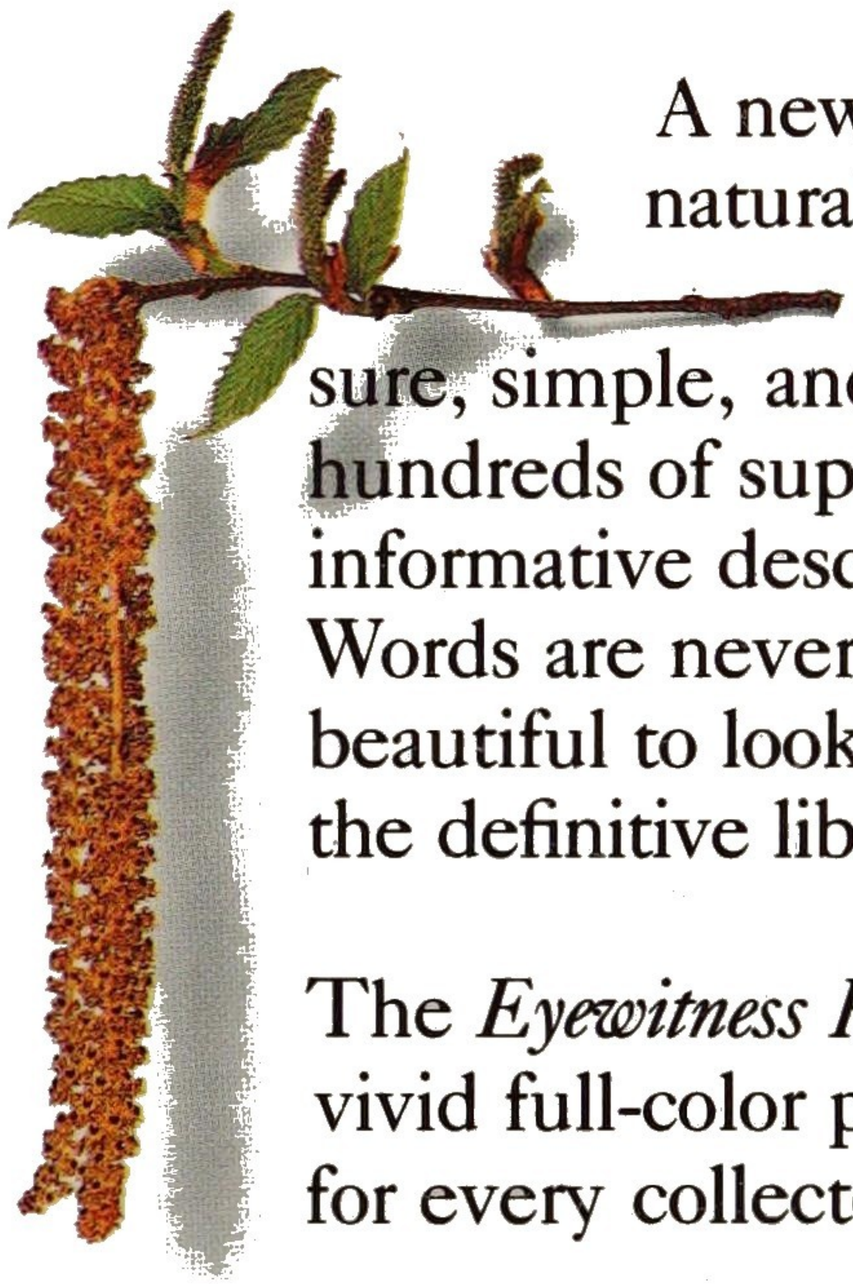

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